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THE
CHILD'S ARITHMETIC
ON A
NEW PLAN
FOR
INFANT SCHOOLS

ILLUSTRATED BY CUTS.

IMPROVED AND ENLARGED BY
REV. WILLIAM W. TURNER
Instructor in the American As

HARTFORD,
H. & F. J. HUNTINGTON

Edw T 118, 30, 275

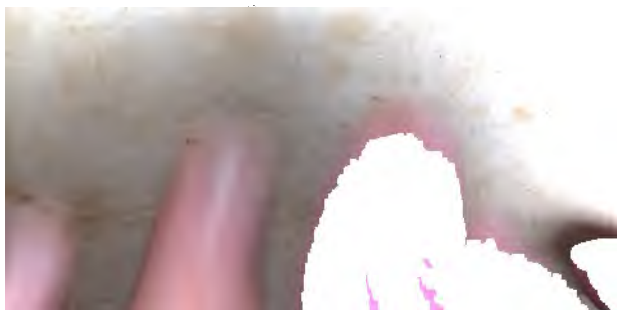


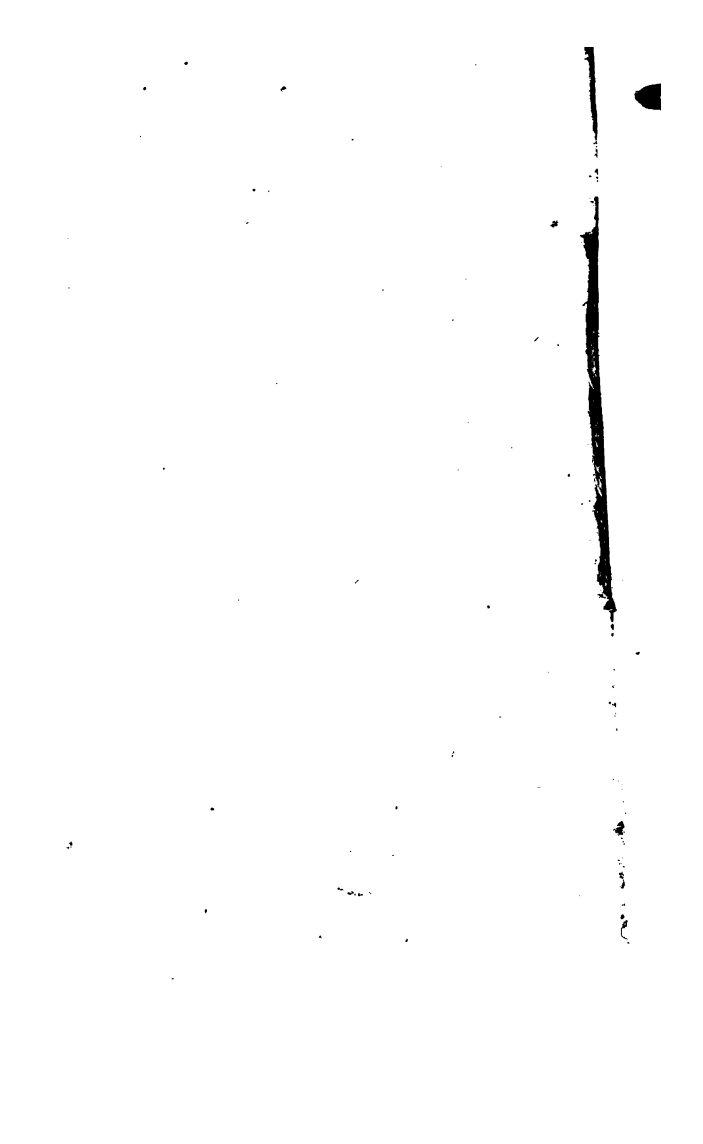
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G. E. White
THE

CHILD'S ARITHMETIC,

ON A PLAN ENTIRELY NEW,

FOR

FAMILIES AND INFANT SCHOOLS.

ILLUSTRATED BY CUTS.

BY

INGRAM COBBIN, M. A.

FIRST AMERICAN FROM THE SECOND LONDON EDITION.

Improved and enlarged by

REV. WILLIAM W. TURNER, A. M.

Instructor in the American Asylum.

Hartford :

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1830.

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20 May 29

District of Connecticut, ss.

Be it remembered, That on the 10th day of October, A. D. 1829, in the 54th year of the Independence of the United States of America, H. and F. J. Huntington, of the said District, have deposited in this office the title of a book, the right whereof they claim as proprietors, in the words following, to wit: "The Child's Arithmetic, on a plan entirely new, for families and infant schools: Illustrated by Cuts. By Ingram Cobbin, M. A. first American from the second London edition. Improved and enlarged by Rev. William W. Turner, A. M. Instructor in the American Asylum." In conformity to the Act of Congress of the United States, entitled "an Act for the encouragement of learning, by securing the copies of Maps, Charts, and Books, to the authors and proprietors of such copies, during the time therein mentioned." And also to an Act, entitled, "an Act supplementary to an Act, entitled an Act for the encouragement of learning, by securing the copies of Maps, Charts, and Books, to the authors and proprietors of such copies, during the times therein mentioned, and extending the benefits thereof to the arts of designing, engraving, and etching historical and other prints."

CHARLES A. INGERSOLL,
Clerk of the district of Connecticut.

A true copy of Record, examined and sealed by me,
CHARLES A. INGERSOLL,
Clerk of the district of Connecticut.

PREFACE.

This little Arithmetic is designed for the use of very young children, and particularly for the pupils of Infant and Primary Schools. It is, with some alterations and additions, the production of Mr. Cobbin, an English gentleman, who has prepared several interesting books for children. "In preparing this work," he remarks in his preface, "the Author has aimed to express himself so as that a child may perfectly comprehend him. He has passed by nothing which appeared to him likely to produce a difficulty, and has made all the opening sums exceedingly simple that the learner may not be discouraged."

The little learner will, at first, be at a loss how to proceed; but let the teacher once fix the attention of the child, and go through with one or two sums under each rule, slowly and distinctly, explaining every step, and illustrating the process by familiar examples, by reference to the fingers, to beans, or black balls; and the child will become interested in the subject, and very soon will be able to work out the sums without assistance. The teacher should invent and propose sums at the time, which have reference to the children in the school, to objects with which they are conversant; and aim chiefly to awaken and fix attention. To effect this desirable object, the author has illustrated many of the sums by *Cuts*. On this subject he thus remarks: "It occurred to the Author's mind that the path to Arithmetic might be smoothed by means of *pictures*, and thus while the learner was gaining the abstract ideas of figures by sensible objects, he would have them, with scarcely any labour, permanently fixed in his mind." Of the utility of this plan, there can be no doubt. It may be thought unwise to perplex the mind of a child six years of age with Arithmetic; but its elements may as easily be taught at this age as any other. The experiment has already been made in our Infant Schools, and with complete success. It has also been made by many intelligent parents, and with the same result. "The only difficulty," says our Author, "is to fix their wandering minds, struck with the ever varying objects that crowd upon their senses; and to meet this by attractions which never fail, is the object of the present pages." And we have no doubt the public will decide that he has well attained his object.

American Asylum, Sept. 1829.

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Count these Dogs, and put their number down in words :



Count these pretty Lambs, and put their number down in words:



Count these Cows, and put down their number in figures :



Count these Goats, and put down their number in figures :



Count these Ships, and put down their number in figures :



Count these Books, and put down their number in figures :



Count these Mice, and put down their number :



Now learn to count twenty :

One, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, thirteen, fourteen, fifteen, sixteen, seventeen, eighteen, nineteen, twenty.

When you can count twenty, tell the same in numbers.

One, Two, Three, Four, Five, Six, Seven, Eight, Nine,
 1 2 3 4 5 6 7 8 9

Ten,	Eleven,	Twelve,	Thirteen,	Fourteen,	Fifteen,
10	11	12	13	14	15
Sixteen,	Seventeen,	Eighteen,	Nineteen,	Twenty.	
16	17	18	19	20	

Now count twenty without the words to tell the numbers.

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20.

Now tell the following numbers.

2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 20.

Now learn to count by tens.

Ten, twenty, thirty, forty, fifty, sixty, seventy, eighty, ninety.

Observe how the tens are set down in figures: ten, is a 1 with a cipher 0, thus 10; twenty, a 2 with a cipher, thus 20; thirty, a 3 with a cipher, thus 30; and so on with the other figures.

Ten,	Twenty,	Thirty,	Forty,	Fifty,	Sixty,
10	20	30	40	50	60
Seventy,	Eighty,	Ninety.			
70	80	90			

And AN HUNDRED is a 1 and two ciphers, thus 100.

A-rith-me-tic is the art of easily reckoning numbers. It teaches how to count; to add;

subtract ; multiply, and divide. It tells us in numbers any quantity, so that we may know how to buy, or sell, or measure, or reckon by it. I want to buy six cents' worth of candy. Mr. Fish will sell me six sticks of candy for my money ; but Mr. Bull will sell me eight sticks. Now, without seeing the candy, I know how many I can get from each, and I buy the eight, because I know, from knowing a-rith-metic, that eight are more than six. This, indeed, I may know without knowing a-rith-metic well, because it is so sim-ple a part of it, yet still it is a part, and shews its great use, for in the same way we buy and sell houses, lands, goods, and other things, to the amount of many thousands of dollars.

Number is that by which quantity of any kind is expressed ; thus we say, *one* cent, *two* dogs, *three* pounds, *four* pints, and shew how many there are.

Figures are marks of different shapes by which we set down numbers, as 1, 2, 3, &c.

A *Cipher*, or round 0, means nothing when alone, but when put to the right of any figure it makes that figure of ten times more value, as 1 when alone means *one*, but with a cipher so 10, it means *ten* ; 2 when alone means *two*, but with a cipher so 20, it means *twenty* ; but if it were written so 01 and 02, the cipher would be of no value, and the 1 would still mean *one*, and the 2 would still mean *two*, because the

cipher would be on the left and not on the right-hand side as it faces you.

A *unit* means *one* of any thing

An *even number* is that which will always make two of the same whole number when exactly divided ; 2 [two,] 4 [four,] 6 [six,] and so on, are even numbers, and 2 [two] will divide into two ones, 4 [four] will divide into two twos, and so on.

An *odd number* is that which will not divide into two of the same whole number ; thus 1 [one,] 3 [three,] 5 [five,] &c. are odd numbers, because we cannot divide them into two whole numbers, but we must if we divide 1 [one] make two marks for half a number, and if we divide 3 [three] we must make it $1\frac{1}{2}$, which means one and a half.

NU-ME-RA-TION.

The Child must learn to know the figures and repeat them, and also repeat the tens to ninety, and then he must read the rest with verbal explanation.

Nu-me-ra-tion teaches us how to write figures down and read them, and how to express a great many at once.

Not to give the young learner too much at first, we will now only mark down three figures.

A figure standing alone is called a unit, thus,

1

Two figures standing together are reckoned from the right hand to the left, units, tens ; thus,

Tens Units

2 1

Three figures standing together are reckoned from the right hand to the left, units, tens, hundreds ; thus,

Hundreds, Tens, Units.

3 2 1

Now observe, a figure placed to the left of another is reckoned at ten times more if it is a figure of 1, twenty times more if it is a figure of 2, thirty times more if it is a figure of 3, and so on for the rest ; each unit, or each 1 contained in each figure, is then of ten times more value on the left hand of another figure or cipher, than it is alone : thus if I write down 2 alone, it is called two ; but if I put it down to the left of another figure, it is called twenty, meaning two tens. The figure before which I put it then

stands for a unit, if it be 1, or units if it be more than one.

You will see this plainer by the following figures :

1 is a unit.

21, is the unit 1 and the tens 2, which means two tens, being at the left of the one : now two tens are twenty, so we reckon two tens twenty, and the one makes twenty-one.

Now put a 2 instead of the 1 and place a 3 before it towards your left hand, instead of the 2, thus, 32

What number is that ? Why 2 units and 3 tens, which make thirty and two—called thirty-two.

Now you know what we mean ; but we will give one more example. Put down a five and put six before it ; now you have

65, sixty-five,

Which are six tens and five units. Now you can tell all about it.

We will now tell you something more. If you put 0 in the place of the units, it stands for nothing, but if any figure is put before it, that figure stands for tens, thus, five before a cipher is fifty 50, six is sixty 60, and so on.

If you can write, now put down in words 1, then 2, next 3, next 4, next 5, next 6, next 7, next 8, next 9, next 10.

If you have done this well, then write in figures, one, two, three, four, five, six seven, eight, nine, ten.

Now write down in words the following figures, and try if you can do them without being told.

11, 24, 29, 27, 35, 41, 52, 73, 67, 84, 92, 20.

Now write in figures the words beneath :

Twenty-one, thirty-three, forty-two, fifty-six, seventy-nine, sixty-four, seventy, ninety-six, eighty.

Now we shall be very wise. Mark, that a third figure put before the tens makes hundreds; thus

123

Is one hundred and twenty-three.

We will see the reason of this. As the second figure, that is, the figure before the unit, means tens, and is ten times more than it would be as a first figure, so the figure before the tens is of ten times more worth than the second figure, or the tens; thus, three ones so placed, are

111

One hundred and eleven.

That is one; ten, which is ten times the one; and one hundred, which is ten times the ten.

Three twos so placed, are

222

That is two hundred and twenty-two.

A two, a three, and a four, will be

234

That is two hundred and thirty-four.

A two and two ciphers will be 200, two hundred; a three, a cipher, and a five, 305, is three hundred and five.

2

Now write down in words the following figures:
 127 325 426 687 952 870

Write down in figures the following words:
 eight hundred, six hundred and twenty, seven
 hundred and one, nine hundred and eight, four
 hundred and fifty-five, five hundred and sev-
 enty.

If you will learn these two Tables, you will
 know how to read and write a long row of fig-
 ures.—Begin at the left hand and say Units,
 Tens, Hundreds, Thousands, and so on.

Table I.

9	Hundreds of Millions.
8	Tens of Millions,
7	Millions,
6	Hundreds of Thousands,
5	Tens of Thousands,
4	Thousands,
3	Hundreds,
2	Tens,
1	Units,

All the numbers from 1 to 10 are Units. 1,
 2, 3, 4, 5, 6, 7, 8, 9, are Units.

All the numbers from 10 up to 100, are
 Tens. 10, 20, 30, 40, 50, 60, 70, 80, 90, are
 Tens.

All the numbers from 100 up to 1000, are
 Hundreds. 100, 200, 300, 400, 500, 600, 700,
 800, 900, are Hundreds.

In this Table you will see under the word

Hundreds, the figure 3, which you must call three hundred ; and under the word Tens, you will see the figure 2, which you must call twenty, because it is 2 tens ; and under the word Units, you will see the figure 1, which you must call one.

Table II.

b	h	ty	th	h	ty	m	h	ty	th	h	ty	*
5	6	7	8	9	8	7	6	5	4	3	2	1

Begin at the left hand, and say, ty, h, th ; ty, h, m ; ty, h, th ; ty, h, b.

Now I will tell you how to read these figures. Look over the figure 7 and you will see the letter *m*, which means millions ; you must call the 7, seven millions. Over the figure 6, you see the letter *h*, which means hundreds ; you must call the 6, six hundred. Over the figure 5 you see the letters *ty*, which mean ten ; you must call the 5, fifty, or five tens. Over the figure 4, you see the letters *th*, which mean thousands ; and you must call the 4, four thousand. Now I have explained to you what these letters mean ; begin at the figure 7, and read towards the left hand, thus : Seven million six hundred and fifty-four thousand, three hundred and twenty-one.

Always remember to put a star or mark over the first left hand figure or units, and place *ty* over the second figure or tens.

AD-DI-TION.

Addition is the putting of two or more things together, and naming them in one lump or sum.

If you hold up 3 fingers on one hand, and 2 fingers on the other, and then count them all together, you will see there are 5 fingers ; so you know by addition, that 3 and 2 make 5.

Sum 1.—Here are some Roses, they are put down as figures should be for addition, one under the other ; and the figure that answers to their numbers is at their side. Now add them up. How many roses do you make ?

Now we begin at the bottom, and say one and one are two and one is three ; then put down three, thus you see then there are three roses.

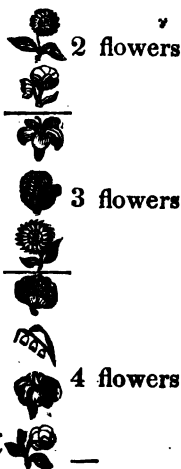


NOTE.—To prove that your sum, is right, begin it again at the top and reckon to the bottom, and see if it comes the same.

Sum 2.—If you have 4 cents in one hand, and 2 cents in the other ; how many cents will you have in both hands ?

Put the cents all together and count them ; one, two, three, four, five, six. So you see 4 and 2 added together make 6.

Sum 3.—Now we will draw a line between each parcel of flowers that is meant by the figures, and then you must count up the figures in like manner : add together 2, 3, and 4, how many do they make ?



Now we begin at the bottom, and say 4 and 3 are 7
and 2 are 9, and put down 9

Now count the flowers singly, and you will find that there are four under the first line, three under the second, and two at the top, answering to the figures 4, 3, and 2, and if you count them one by one you will find nine flowers.

Sum 4.—If you have 5 apples in your box, and 3 apples in your pocket, and 2 apples in your hand ; how many apples have you in all ?

Set down the figure 5, and under it the figure 3, and under this the figure 2. Then begin at the bottom and add thus ; 2 and 3 are 5, and 5 are 10.

5
3
2

—
10 Thus you find you

have ten apples in all.

Sum 5.—Add up these Pears by the numbers, how many are there ?

2	3
2	
2	4
2	
2	3
2	
2	5
2	
2	—
2	15

Now say, 5 and 3 are 8, and 4 are 12, and 3 are 15, and put down 15, that is 1 in the place of the tens, being one ten, and a five.

Now if you count the pears you will find there are just fifteen: so you see that the figures mean the quantity of pears for which they are each set down, and when reckoned up they amount exactly to the same.

EXPLANATION OF THE ADDITION TABLE.

SECTION I.

One and One are Two.



1



1

and 1 are 2

2

One and Two are Three.



1



and 2

are 3

3

3

One and Three are Four.



1

and 3

are 4

4

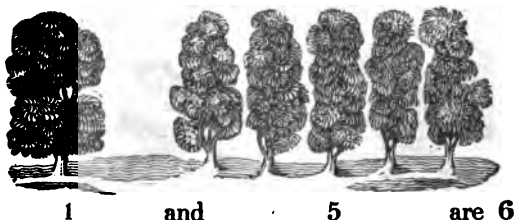
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ADDITION.

One and Four are Five.



One and Five are Six.

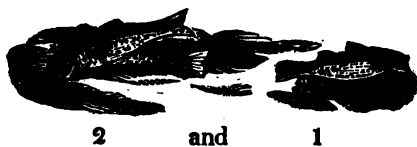


SECTION II.

One and One are Two.



Two and One are Three.



Three and One are Four.



3 and 1 are 4

Four and One are Five.



4 and 1 are 5

Five and One are Six.



5 and 1 are 6

ADDITION.

Now learn the ADDITION TABLE.

<i>Lesson 1.</i>	1 and 1 are	2
	1 and 2 are	3
	1 and 3 are	4
	1 and 4 are	5
	1 and 5 are	6
	1 and 6 are	7
	1 and 7 are	8
	1 and 8 are	9
	1 and 9 are	10

<i>Lesson 2.</i>	2 and 1 are	3
	2 and 2 are	4
	2 and 3 are	5
	2 and 4 are	6
	2 and 5 are	7
	2 and 6 are	8
	2 and 7 are	9
	2 and 8 are	10
	2 and 9 are	11

<i>Lesson 3.</i>	3 and 1 are	4
	3 and 2 are	5
	3 and 3 are	6
	3 and 4 are	7
	3 and 5 are	8
	3 and 6 are	9
	3 and 7 are	10
	3 and 8 are	11
	3 and 9 are	12

Lesson 4.

4 and 1 are 5
 4 and 2 are 6
 4 and 3 are 7
 4 and 4 are 8
 4 and 5 are 9
 4 and 6 are 10
 4 and 7 are 11
 4 and 8 are 12
 4 and 9 are 13

Lesson 5.

5 and 1 are 6
 5 and 2 are 7
 5 and 3 are 8
 5 and 4 are 9
 5 and 5 are 10
 5 and 6 are 11
 5 and 7 are 12
 5 and 8 are 13
 5 and 9 are 14

Lesson 6.

6 and 1 are 7
 6 and 2 are 8
 6 and 3 are 9
 6 and 4 are 10
 6 and 5 are 11
 6 and 6 are 12
 6 and 7 are 13
 6 and 8 are 14
 6 and 9 are 15

Lesson 7. 7 and 1 are 8
 7 and 2 are 9
 7 and 3 are 10
 7 and 4 are 11
 7 and 5 are 12
 7 and 6 are 13
 7 and 7 are 14
 7 and 8 are 15
 7 and 9 are 16

Lesson 8. 8 and 1 are 9
 8 and 2 are 10
 8 and 3 are 11
 8 and 4 are 12
 8 and 5 are 13
 8 and 6 are 14
 8 and 7 are 15
 8 and 8 are 16
 8 and 9 are 17

Lesson 9. 9 and 1 are 10
 9 and 2 are 11
 9 and 3 are 12
 9 and 4 are 13
 9 and 5 are 14
 9 and 6 are 15
 9 and 7 are 16
 9 and 8 are 17
 9 and 9 are 18

Lesson 10. 10 and 2 are 12
 12 and 3 are 15
 15 and 5 are 20
 20 and 6 are 26
 26 and 7 are 33
 33 and 9 are 42

Sum 6.—Now do some figures alone. Put down and add together

1, 2, 3, 4, 5.

Put the line with the figures under one another, thus ;

$$\begin{array}{r} 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ \hline 15 \end{array}$$

and then begin with the bottom, and say 5 and 4 are 9 and 3 are 12 and 2 are 14 and 1 is 15 ; then draw a line under all and set down 15.

Sum 7.—Add together

2, 3, 4, 5, 6.

Here you will have twenty, for which put 2 before the units.

Sum 8.—Add together

6, 8, 9, 4, 3.

Here you will have thirty, for which put a three before the units.

Sum 9.—Add together

1, 8, 7, 6, 5, 4.

3

Sum 10.—Add together

4, 3, 6, 9, 2, 1.

Sum 11.—Put down and add together 2, 6, 4, 9, 7, 5.

2

6

4

9

5 and 7 are 12, and 9 are 21, 7
and 4 are 25, and 6 are 31, and 5
2 are 33; then put 3 under the —
units and 3 under the tens. 33

Sum 12.—Put down and add together

8, 3, 4, 7, 6, 5.

Sum 13.—Put down and add together

8, 6, 7, 8, 9, 8.

Sum 14.— 9, 8, 7, 9, 6, 9.

Sum 15.—Add together 15, 18, 10 and 12.

15 Fifteen

18 Eighteen

10 Ten

12 Twelve

—

55

—

Here you begin with the unit figure 2, and go up the row and skip the 0 as it stands for nothing, and say 2 and 8 are 10, and 5 are 15, then you set down 5 under the units, and having a ten left you carry that ten to the second row which is tens, and say one, meaning the ten which is left, and one are two, and one are three, and one are 4, and one are five, that is

five tens, and you put down 5 in the row of tens. That makes 55, fifty-five, 5 tens and 5 units.

Sum 16.—Add together
10, 21, 31, 11, 19.

Sum 17.—Add 23, 29, 65, 20, 31.

$$\begin{array}{r}
 23 \\
 29 \\
 65 \\
 20 \\
 31 \\
 \hline
 168
 \end{array}$$

Here you say, 1 and 5 are 6, and 9 are 15, and 3 are 18, and you put down 8 and carry 1 to the tens; then say 1 and 3 are 4, and 2 are 6, and 6 are 12, and 2 are 14, and 2 are 16, then put down 6, and 1 under the hundreds, which the third figure means; for as there are 16 tens, after you have put down 6 of them there are ten left, which make just one hundred, so you have one hundred and sixty-eight.

Sum 18.—Add 26, 34, 62, 51, 97.

Sum 19.—Add 35, 49, 65, 48, 94.

Sum 20.—Add 35, 62, 53, 94, 69, 58.

Sum 21.—Add 36, 39, 59, 78, 99, 87.

Sum 22.—Add 88, 98, 78, 99, 29, 87.

Sum 23.—Add 109, 220, and 321,

$$\begin{array}{r}
 109 \\
 220 \\
 321 \\
 \hline
 650
 \end{array}$$

Here you say 1 and 9 are 10, there are no units, put down 0 in their place ; then carry 1 for your ten, and say 1 and 2 are 3 and 2 are 5, put down 5 ; and then go to the third row or hundreds, and say, as you have nothing to carry, 3 and 2 are 5 and 1 are 6.

Sum 24.—Add 100, 102, 107.

Sum 25.—Add 402, 101, 121.

Sum 26.—Add 521, 123, 210.

Sum 27.—Add 512, 210, 97, 11.

Here there are three figures in some and two in others ; mind and place the two figures in their right places under the units and tens of the others, that you may cast up in the same column all those of the same value, for if by mistake you put one of the tens figures into the third column, you will reckon it for hundreds, and make all wrong. Place the figures thus, and all sums of the same kind ;

$$\begin{array}{r} 512 \\ 210 \\ 97 \\ 11 \\ \hline 830 \end{array}$$

Sum 28.—Add 211, 14, 210, 13. Place these figures thus, and add them up.

$$\begin{array}{r} 211 \\ 14 \\ 210 \\ 13 \\ \hline \end{array}$$

You see the units and tens of the 14 and 13 keep their proper places under the 11 and the 10 of the other numbers.

Sum 29.—Add 27, 101, 13, 27. Place these thus :

$$\begin{array}{r} 27 \\ 101 \\ 13 \\ 27 \\ \hline \end{array}$$

Sum 30.—Add 109, 211, 26, 41.

Sum. 31.—Add 220, 119, 29, 222

Sum 32.—Add 12, 120, 19, 1.

Here you must place the unit 1 under the units of the figures, or in the same line with
3*

them, and if it were first, it would be of course over them :

$$\begin{array}{r} 12 \\ 120 \\ 19 \\ 1 \\ \hline \end{array}$$

Sum 33.—Add 17, 121, 18, 3.

Sum 34.—Add 18, 211, 19, 6.

Sum 35.—Add 108, 220, 435, 432.

$$\begin{array}{r} 108 \\ 220 \\ 435 \\ 432 \\ \hline \end{array}$$

1195

Here we have a fourth figure in the sum total, which place again to the left, and it stands for a thousand ; if it had been a 2, it would have stood for two thousand, and a 3 for three thousand, and so on. Then we have in this line, reckoning from the 5 which is units, thus, units, tens, hundreds, thousands, one thousand one hundred and ninety-five.

Sum 36.—Add 101, 925, 18, 2, 930.

Sum 37.—Add 999, 876, 435, 721, 10.

AMUSING SUMS IN ADDITION.

Sum 38.—James had 4 apples given to him,

John had 20 that he bought, George had 16 at home, and Ann expected to have 19. How many would they then have together? Put down ---

For James	4
John	20
George	16
Ann	19
	59



Sum 39.—We want to go from Hartford to New York: now we must go from Hartford to Middletown, which is 15 miles; and from Middletown to New Haven, which is 25 miles; and from New Haven to Stratford, which is 13 miles; and from Stratford to Norwalk, which is 18 miles; and from Norwalk to Greenwich, which is 17 miles; and from Greenwich to Pelham, which is 20 miles; and from Pelham to New York, which is 18 miles: how far is it then from Hartford to New York? Put down, from Hartford to Middletown 15
Middletown to N. Haven 25
and so for the rest and add them together.

Sum 40.

Thirty days hath September,
April, June, and November ;
February hath twenty-eight alone,
And all the rest have thirty-one.

Then how many days are there in the year?

Now write down the names of the months in a column, and put against September, April, June, and November, 30, against February 28, and against all the rest 31. Thus,

January	31
February	28
March	31

And when you have put down the whole 12, add them up.



Sum 41—If there are 20 pews at church, and in each of 5 pews there are ten persons ; in each of 6 pews 9 persons ; and in each of the remaining 9 pews, 3 persons, how many are there in all ?

5 pews, each 10 persons.

Pew 1	10
2	10
3	10
4	10
5	10

6 pews, each 9 persons.

Pew 1	9
2	9
3	9
4	9
5	9
6	9

9 pews, each 3 persons.

Pew 1	3
2	3
3	3
4	3
5	3
6	3
7	3
8	3
9	3

Sum 42.—A man has 25 sheep in one field; and 37 sheep in another field; and 18 in his yard; and 9 have strayed into the woods; he has also 46 lambs; how may sheep and lambs has he in all?

Now learn to write down a dozen, thus, 12.

A dozen, you see, is the same as twelve, it is only another word for it.

Write down a score, thus 20 ; you see that a score means only another word for twenty.

You know how to write a hundred ; thus, 100 ; and you know how to write a thousand ; thus 1000.

There is also what is called a gross, that is 12 dozen, or 12 times 12. Now 12 being added together twelve times makes 144 ; then a gross is 144.

Sum 43.—Add two score, two hundred and one, three dozen, and 1 gross together.

Two score are two twenties, that is	40
Two hundred and one we write thus	201
Three dozen are 3 twelves, if added together	36
One gross is	144

Sum 44.—Put down and add together two dozen, two score, and one hundred.

SUB-TRAC-TION.

SUBTRACTION is taking away one or more things from two or many things, to know what may remain.

If you put two books on the table and take one away, how many will remain ? Answer. One.

Now observe, you must always put your large number first, and your small number under it, thus :

Large number 2

Small number 1

Now say, take 1 from 2 --
and there remains 1

To prove your sum is right in subtraction, add your remainder to what you have taken out. Your remainder here is one, and you have taken one from two, then say 1 and 1 are 2, and if it comes the same as the top line, your sum is right.

You see how easy this is, and it is very amusing.

Hold up four fingers, then bend down two of them, and two will remain up.



4 fingers up,
2 of them put down,

—
2 remain up.

That is, take 2 from
4, and 2 remain.



EXPLANATION OF THE SUBTRACTION TABLE.

To show the operation of the subtraction ta-

ble, double the leaf down from top to bottom, so as to cover the number to be subtracted. This practice will be sure to attract and instruct. You take away the number that you cover with the folded paper, and of course the rest remain.

SECTION I.

Double the leaf from top to bottom, so as to cover one.

Take One from Two,



there remains
One.

Take one from Three,



there remain
Two.

Take One from Four,



there remain Three,

Take One from Five,



there remain Four.

SECTION II.

Double the leaf down from top to bottom so as to cover two, three, and five in the respective Examples.

Take Two from Three,



there remains One.

Take Two from Four,



there remain Two.

Take Three from Six



There remain Three.

Take Five from Nine,



There remain Four.

SUBTRACTION TABLE

TO BE LEARNT.

Lesson 1.—Take 1 from

1	there remains 0
— 1 from	2 there remains 1
— 1 from	3 there remain 2
— 1 from	4 there remain 3
— 1 from	5 there remain 4
— 1 from	6 there remain 5
— 1 from	7 there remain 6
— 1 from	8 there remain 7
— 1 from	9 there remain 8
— 1 from	10 there remain 9

Lesson 2.—Take 2 from

2	there remains 0
— 2 from	3 there remains 1
— 2 from	4 there remain 2
— 2 from	5 there remain 3
— 2 from	6 there remain 4
— 2 from	7 there remain 5

- 2 from 8 there remain 6
 - 2 from 9 there remain 7
 - 2 from 10 there remain 8
-

- Lesson 3.**—Take 3 from 3 there remains 0
- 3 from 4 there remains 1
 - 3 from 5 there remain 2
 - 3 from 6 there remain 3
 - 3 from 7 there remain 4
 - 3 from 8 there remain 5
 - 3 from 9 there remain 6
 - 3 from 10 there remain 7
-

- Lesson 4.**—Take 4 from 4 there remains 0
- 4 from 5 there remains 1
 - 4 from 6 there remain 2
 - 4 from 7 there remain 3
 - 4 from 8 there remain 4
 - 4 from 9 there remain 5
 - 4 from 10 there remain 6
-

- Lesson 5.**—Take 5 from 5 there remains 0
- 5 from 6 there remains 1
 - 5 from 7 there remain 2
 - 5 from 8 there remain 3
 - 5 from 9 there remain 4
 - 5 from 10 there remain 5
-

- Lesson 6.**—Take 6 from 6 there remains 0
- 6 from 7 there remains 1
 - 6 from 8 there remain 2
 - 6 from 9 there remain 3
 - 6 from 10 there remain 4

- Lesson 7.**—Take 7 from 7 there remains 0
 — 7 from 8 there remains 1
 — 7 from 9 there remain 2
 — 7 from 10 there remain 3

- Lesson 8.**—Take 8 from 8 there remains 0
 — 8 from 9 there remains 1
 — 8 from 10 there remain 2

- Lesson 9.**—Take 9 from 9 there remains 0
 — 9 from 10 there remains 1

Sum 1.—Now you can take 3 from 6, and see how many remain. Do it in the same way, and put the highest number first, that is **six**.

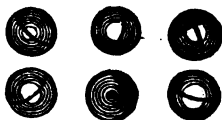
6
3

Now say, take three from six and —
 there remain 3

Now add what you have taken out —
 to the remainder, and you have
 the proof 6 the same
 as the top.

This you can see to be a sure way of taking a smaller number from a larger one, and knowing what remain. But let us do the same sum in another way.

Here are six balls,



Now, if we put a bit of paper, or the edge of a book, or our hand, on the lower three, how many remain?—Why, three, Then you see, that if you take 3 from 6 there remain 3.

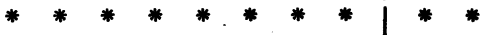
Sum 2.—Now take eight from ten, how many remain?

Put down the highest number 10

Now put 8 under the units - 8

Eight from ten and there remain 2

Here are ten stars, we will cut off 8 of them on the left hand by a stroke, and then you will see that 2 only remain.



Sum 3.—Take 9 from 12, how many remain?

Here are 12 pens, and we will take away 9 by putting a finger on them, and we shall then see how many remain.



Now take 9 from the bottom, counting upwards, you then come to the line drawn across, above which are the other 3 which remain out of the 12. This we do thus,

$$\begin{array}{r} 12 \\ 9 \\ \hline \end{array}$$

Take 9 from 12, and there remain 3

$$\begin{array}{r} 12 \\ 9 \\ \hline 3 \end{array}$$

Now to prove your sum correct, and all other sums in subtraction, add the two bottom lines together, and see if they come the same as the top ; if so the sum is right, if not, it is

wrong. You took away 9 from 12, and left 3 behind; you put the 9 and the three again together, and they will again make 12.

Sum 4.—Take 11 from 12, how many remain?

Sum 5.—Take 8 from 10, how many remain?

Sum 6.—Take 2 from 12, how many remain? Put down 12 pins, or peas, or marbles on the table, and take 2 from them, and you will see how many remain. But you ought now to begin and do without these helps.

Sum 7.—Take 6 from 11, how many remain?

Sum 8.—Take 30 from 35, how many remain? Here put down the highest number first,

	35
Now put down under it	30

Now take 30 from 35, and there remain 5

This you do this way; say if we take nothing from 5, why 5 still remain. If we have 5 apples on the table and take none away, why 5 apples still remain. Then say 3 from 3 and nothing remains; for if I take 3 apples when there are only 3 to take from, I leave none behind. So in all cases you can never have any remainder if you take the same num-

ber from the same. For if you take 7 from 7, of course you take all away and nothing remains: so with 6 from 6, and 8 from 8, and the rest.

Sum 9.—Now take 12 from 29, how many remain?

Greater number	29
Less number	12
	—
	17

Here say 2 from 9 and there remain 7, and put down 7 under the 2; then say 1 from 2 and there remains 1.

You have here 2 units to take from 9 units; and 1 ten from 2 tens, which is the same thing as taking 2 from 9 and 1 from 2, and your remainder is 1 ten by taking 1 from 2, and 7 units by taking 2 from 9. This is easier than taking 12 from 29.

Sum 10.—Take 27 from 39, how many remain? Here let the little pupil first do the sum in the same way as the last, and so for the next three sums.

Sum 11.—Take 39 from 59, how many remain? Mind here that if you take 9 from 9, being the same figures, nothing remains.

Sum 12.—Take 25 from 35, how many remain?

• *Sum 13.*—Take 42 from 59, how many remain?

Sum 14.—Take 37 from 41, how many remain? Here let the little learner observe, that

although we cannot take a large number from a small one, as for instance, we cannot take 20 apples from 10, and therefore the large number must always be at the top, and the small one at the bottom which we subtract from it, yet there are small figures that must sometimes be above larger ones, for which we have a remedy.

Now we put down 41 the greater number,
And 37 the less number.

4

But when we come to subtract, 7 is larger than 1. Therefore we cannot take 7 from 1, but we say 7 from 1 I cannot, but 7 from 11, and there remain 4; this we call *borrowing*, for we are supposed to take ten from the next column which is tens, and one of which makes ten of that we want, and we add it to the top figure, by which we make the larger number to enable us to subtract. Therefore in all cases where the upper figure is less than the bottom, borrow ten and add to it, and then subtract the bottom one from it. Now we have borrowed ten from the tens, but that we must pay, and therefore we go to the next figures and say, 1 I borrowed I pay to the 3 is 4, now 4 from 4 and nothing remains; this being the last left hand figure and 0 being of no value, it is not put down, but a blank is left, and the sum stands 4.

Sum 15.—Now subtract 59 from 93

$$\begin{array}{r} 93 \\ 59 \\ \hline 34 \\ \hline \end{array}$$

Now say 9 from 3 I cannot, but I must borrow 10, and 10 and 3 make 13; then 9 from 13 and there remain 4, put down 4; then say 1 I carry to 5 makes 6, 6 from 9 and there remain 3, put down 3.

Sum 16.—We will do one or two more, and then the little pupil can do the rest without help. Subtract 78 from 95.

$$\begin{array}{r} 95 \\ 78 \\ \hline 17 \\ \hline \end{array}$$

Say 8 from 5 I cannot, but 8 from 15 (as I borrow 10) there remain 7, 1 that I carry to 7 makes 8, 8 from 9 there remains 1.

Sum 17.—Subtract 89 from 93.

$$\begin{array}{r} 93 \\ 89 \\ \hline 4 \\ \hline \end{array}$$

9 from 3 I cannot, but 9 from 13 and there remain 4, carry 1 to 8 makes 9, 9 from 9 nothing remains.

There is another way of subtracting, where

the lower figure is larger than the upper figure. We must borrow 10 as before, take the lower figure from 10, and add the upper figure to the remainder; and then carry 1 to the next lower figure.

Sum 18.—Subtract 47 from 62.

$$\begin{array}{r} 62 \qquad 10 \\ 47 \text{ } 7 \\ \hline 15 \text{ } 3 \\ \hline \end{array}$$

Say 7 from 2 I cannot, but 7 from 10 there remain 3; then add the upper figure 2 to this remainder 3, and the sum will be 5. Set this down under the 7, and carry 1 to 4, which makes 5. 5 from 6 there remains 1.

Sum 19.—Subtract 36 from 52.

Sum 20.—Subtract 49 from 73.

Sum 21.—Subtract 58 from 90.

Here the pupil must borrow a ten as with the others, because he cannot take 8 from 0 nothing.

Sum 22.—Now do three figures the same way. Subtract 128 from 239.

$$\begin{array}{r} 239 \\ 128 \\ \hline 111 \\ \hline \end{array}$$

Say 8 from 9 and there remains 1, put down 1 to the units; 2 from 3 there remains 1, put down another 1 to the tens; 1 from 2 there remains 1, put down another 1 to the hundreds.

Sum 23.—Subtract 139 from 249.

Sum 24.—Subtract 290 from 357.

Sum 25.—Subtract 280 from 329.

Sum 26.—Now subtract 267 from 436.

Here are two upper figures less than the lower ones, but the whole amount of the sum to be subtracted is of course less than the other. These are done as with the two figures. Thus,

$$\begin{array}{r} 435 \\ 267 \\ \hline \end{array}$$

$$\begin{array}{r} 435 \\ 267 \\ \hline 168 \end{array}$$

Now say 7 from 15 there remain 8, put down 8, carry 1; 1 I carry to 6 makes 7, 7 from 13 and there remain 6, put down 6, carry 1 again; 1 I carry to 2 makes 3, 3 from 4 and there remains 1, put down 1.

Sum 27.—Subtract 526 from 720.

Sum 28.—Subtract 631 from 739.

Sum 29.—Subtract 725 from 823.

Sum 30.—Subtract 732 from 921.

Sum 31.—Subtract 1234 from 2345.

Sum 32.—Subtract 3437 from 4548.

Sum 33.—Subtract 1890 from 2971.

Sum 34.—Subtract 230 from 1790.

Here mind and put the figures with the units under the units, the tens under the tens, and the hundreds under the hundreds, thus,

$$\begin{array}{r} 1790 \\ 230 \\ \hline \end{array}$$

Sum 35.—Subtract 327 from 1825.

Sum 36.—Subtract 25 from 1932.

Here put the units under the units and the tens under the tens.

$$\begin{array}{r} 1932 \\ 25 \\ \hline \end{array}$$

Sum 37.—Subtract 34 from 2327.

Sum 38.—Subtract 39 from 8763.

Sum 39.—Subtract 7 from 2309.

Here put the 7 under the 9, that is its place, as you have only to subtract from the units.

Thus,

$$\begin{array}{r} 2309 \\ 7 \\ \hline \end{array}$$

Sum 40.—Subtract 8 from 2709.

Sum 41.—Subtract 6 from 2807.

Sum 42.—Subtract 9 from 1820.

AMUSING AND INSTRUCTIVE SUMS IN SUBTRACTION.

Sum 43.—If you were born in the year 1821, how old are you now in 1829?

Mind and put the highest number first, and subtract the lowest from it; indeed, you cannot take a large number from a small one.

$$\begin{array}{r} 1829 \\ 1821 \\ \hline \end{array}$$

8 years old.

Now in all the other sums do the same ; and in all like questions, put the highest number first, subtract the lowest from it, and you will have the difference, or answer.

Sum 44.—If your papa was born in the year 1795, how old is he now in the year 1829 ?

1829

1795



Sum 45. Louis XVI. King of France, had his head cut off in the year 1793, how long since is it in 1829 ?

Sum 46.—George IV. began to reign in the year 1820, how long has he reigned now in 1829 ?

Sum 47.—Buonaparte died at St. Helena in 1820, how long has he been dead in 1829 ?

Sum 48.—King William the Conqueror conquered England in the year 1068, how long ago is it now in 1829?

Sum 49.—Suppose this year, 1829, you were 15 years old, what year were you born in?

Here mind still and subtract the little number from the great one, and you will have the answer of the year.

Sum 50.—If you had 927 marbles, and lost 7 yesterday, 19 the day before, and 29 to-day, how many would you have remaining?

Mind first and add the numbers together that you have lost.

Numbers lost which you must add $\left\{ \begin{array}{l} 7 \\ 19 \\ 29 \end{array} \right.$

Then subtract them from the number you had, 927.

Sum 51.—If Mr. A. owes me 10 dollars for money lent to him last week, and 21 dollars for money lent yesterday, and 5 dollars for money lent to-day, and I owe him 70 dollars for a purchase he has made for me this afternoon; how much is the difference I have got to pay him?

Sum 52.—A good woman had a basket in which were 58 nice apples. She gave Elizabeth 15 apples, and Charles 9 apples, and Maria 7 apples; how many had she left in her basket?

Sum 53.—A lady gave little Mary 50 cents

Then Mary went to a store and bought a red fan for 12 cents, and a thimble for 10 cents, and a comb for 8 cents, and as she was going home, she gave a poor old beggar 6 cents; how many cents had she left?

MULTIPLICATION.

MULTIPLICATION is a short way of doing addition.

Before this rule can be done, you must learn by heart the Multiplication Table, which is soon got, and has been learnt by many little children. If you learn it aloud, or sing it to some tune, you will learn it quickly. We will divide it into Lessons, which you will say to your kind teacher.

EXPLANATIONS OF THE MULTIPLICATION TABLE.

SECTION I.

Twice one



1

1

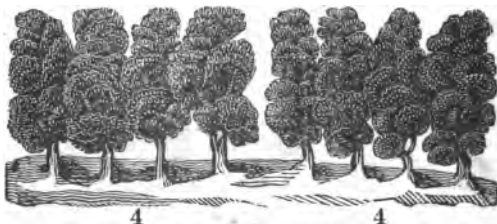
are two

Twice three



are six.

Twice four



are eight.

Twice five



are ten.

SECTION II.

Three times two



are six.

Four times two



2

2

2

2

are eight.

Four times three



3

3

3

3

are twelve.

Five times two



2

2

2

2

2

are ten.

<i>Lesson 1.</i>	Twice	1 are	2
	Twice	2 are	4
	Twice	3 are	6
	Twice	4 are	8
	Twice	5 are	10
	Twice	6 are	12
	Twice	7 are	14

Twice 8 are 16

Twice 9 are 18

Twice 10 are 20

Twice 11 are 22

Twice 12 are 24

Lesson 2. Three times 1 are 3

Three times 2 are 6

Three times 3 are 9

Three times 4 are 12

Three times 5 are 15

Three times 6 are 18

Three times 7 are 21

Three times 8 are 24

Three times 9 are 27

Three times 10 are 30

Three times 11 are 33

Three times 12 are 36

Lesson 3. Four times 1 are 4

Four times 2 are 8

Four times 3 are 12

Four times 4 are 16

Four times 5 are 20

Four times 6 are 24

Four times 7 are 28

Four times 8 are 32

Four times 9 are 36

Four times 10 are 40

Four times 11 are 44

Four times 12 are 48

<i>Lesson 4.</i>	Five times	1 are	5
	Five times	2 are	10
	Five times	3 are	15
	Five times	4 are	20
	Five times	5 are	25
	Five times	6 are	30
	Five times	7 are	35
	Five times	8 are	40
	Five times	9 are	45
	Five times	10 are	50
	Five times	11 are	55
	Five times	12 are	60

<i>Lesson 5.</i>	Six times	1 are	6
	Six times	2 are	12
	Six times	3 are	18
	Six times	4 are	24
	Six times	5 are	30
	Six times	6 are	36
	Six times	7 are	42
	Six times	8 are	48
	Six times	9 are	54
	Six times	10 are	60
	Six times	11 are	66
	Six times	12 are	72

<i>Lesson 6.</i>	Seven times	1 are	7
	Seven times	2 are	14
	Seven times	3 are	21
	Seven times	4 are	28
	Seven times	5 are	35
	Seven times	6 are	42

Seven times 7 are 49
Seven times 8 are 56
Seven times 9 are 63
Seven times 10 are 70
Seven times 11 are 77
Seven times 12 are 84

Lesson 7. Eight times 1 are 8
Eight times 2 are 16
Eight times 3 are 24
Eight times 4 are 32
Eight times 5 are 40
Eight times 6 are 48
Eight times 7 are 56
Eight times 8 are 64
Eight times 9 are 72
Eight times 10 are 80
Eight times 11 are 88
Eight times 12 are 96

Lesson 8. Nine times 1 are 9
Nine times 2 are 18
Nine times 3 are 27
Nine times 4 are 36
Nine times 5 are 45
Nine times 6 are 54
Nine times 7 are 63
Nine times 8 are 72
Nine times 9 are 81
Nine times 10 are 90
Nine times 11 are 99
Nine times 12 are 108

MULTIPLICATION.

Lesson 9.

Ten times	1 are	10
Ten times	2 are	20
Ten times	3 are	30
Ten times	4 are	40
Ten times	5 are	50
Ten times	6 are	60
Ten times	7 are	70
Ten times	8 are	80
Ten times	9 are	90
Ten times	10 are	100
Ten times	11 are	110
Ten times	12 are	120

Lesson 10.

Eleven times	1 are	11
Eleven times	2 are	22
Eleven times	3 are	33
Eleven times	4 are	44
Eleven times	5 are	55
Eleven times	6 are	66
Eleven times	7 are	77
Eleven times	8 are	88
Eleven times	9 are	99
Eleven times	10 are	110
Eleven times	11 are	121
Eleven times	12 are	132

Lesson 11.

Twelve times	1 are	12
Twelve times	2 are	24
Twelve times	3 are	36
Twelve times	4 are	48
Twelve times	5 are	60
Twelve times	6 are	72

Twelve times 7 are 84
Twelve times 8 are 96
Twelve times 9 are 108
Twelve times 10 are 120
Twelve times 11 are 132
Twelve times 12 are 144

Now we will see the use of Multiplication. We have said it is a short way of doing addition.

You want to know how many two threes make; instead of saying 3 and 3 are 6, you say twice 3 are 6. This alteration in so small a number is of little value, but in higher numbers it is of much value. For instance, you want to know how many twelve nines make. Now in addition you must put down 12 figures of nine, one under the other, and add them up.— This takes some time: but in Multiplication you say in a moment, 12 times 9 are 108.— This you can do by your rule only. But you have larger numbers and then you must do a sum.

Before you do a sum, we will just see by the following pictures a proof of the way of doing multiplication.

Once three are three.



Twice three are six.

3

3

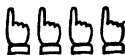
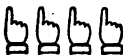


6

Twice four are eight.

4

4



8

Three times three are nine.



9

You see by these pictures how exactly the table tells you the numbers. See the last for instance, there are three and three and three posts, and three threes if you count them are 9, therefore three times three are nine.

Sum 1.—Multiply 22 by 2.

Put down 22 which is called the multiplicand.

Put down two

under the units 2 which is called the multiplier.

44 is called the product.

Now say twice 2 are 4, put down 4 under the 2, you have then 4 units; now go to the tens, and say again twice 2 are 4, that is 4 tens, which you put under the tens. Then twice 22 are 44.

You see that the upper line is called the multiplicand. The sum by which it is multiplied is called the multiplier, and the total is called the product. To multiply is to increase in number, as here two twenty-twos are made 44.

If in doing the other sums you forget how much any multiplier makes of the multiplicand, or figure it multiplies, look at your table and try to remember it again.

Sum 2.—Multiply 33 by 3.

If you cannot repeat the line three times three of your multiplication table, learn that line well by itself, and then do your sum, and so for the rest.

Sum 3.—Multiply 76 by 4.

$$\begin{array}{r} \text{Put down} \quad 76 \\ \quad \quad \quad 4 \\ \hline 304 \end{array}$$

Then say 4 times 6 are 24; put down 4 under the 4; you have now 4 units, and 2 tens to carry. Then say 4 times 7 are 28, and 2 to carry make 30, which are 30 tens or 300: but in the units place you already have 4, so the whole will make 304.

Sum 4.—Multiply 81 by 5.

Sum 5.—Multiply 83 by 6.

Sum 6.—Multiply 71 by 7.

Sum 7.—Multiply 84 by 8.

Sum 8.—Multiply 39 by 9.

Sum 9.—Multiply 43 by 10.

Here there is a very short and easy way, whenever you are to multiply by 10 or 20 or 30, or any number ending with an 0, place it so :

$$\begin{array}{r} 43 \\ 10 \\ \hline 430 \\ \hline \end{array}$$

Here you say 0, then once 3, then 4.

Or supposing you are to multiply 52 by 20, then put down.

$$\begin{array}{r} 52 \\ 20 \\ \hline 1040 \\ \hline \end{array}$$

Here you say 0, twice 2 are 4, twice 5 are 10. This makes it just the same as if you were to say 10 times 3 are 30, and ten times 4 are 40, and 3 are 43, which would be set down 430. The reason why it comes the same is, that by putting the 0 in advance, you make all the figures to the left of ten times more value, and therefore multiplying by 2, is as if you multiplied by twenty or 2 tens, 3 as if by 30, and so on.

Sum 10.—Multiply 57 by 10.

Sum 11. —Multiply 59 by 11.

$$\begin{array}{r} 59 \\ 11 \\ \hline 649 \end{array}$$

Here you say 11 times 9 are 99, and you put down 9 under the units, and as in addition carry the 9 remaining to the tens; and you say 11 times 5 are 55, and the 9 I carry make 64.

Sum 12.—Multiply 74 by 12.

Sum 13.—Multiply 83 by 12.

Sum 14.—Multiply 97 by 12.

Sum 15.—Multiply 99 by 12.

Sum 16.—Multiply 223 by 7.

$$\begin{array}{r} 223 \\ 7 \end{array}$$

$$\hline 1561$$

By carrying your tens from the units, and your hundreds from the tens, as in addition, you are sure to be right. Thus in the sum just done you say 7 times 3 are 21, put down 1 and carry 2; then 7 times 2 are 14 and 2 that you carry make 16, put down 6 and carry 1; then 7 times 2 again are 14 and 1 makes 15, which completes the sum, and you put down 15 under the hundreds, which means 15 hundred, or one thousand five hundred.

Sum 17.—Multiply 349 by 9.

Sum 18.—Multiply 243 by 8.

Sum 19.—Multiply 420 by 3.

Sum 20.—Multiply 530 by 4.

TO MULTIPLY BY TWO FIGURES, NOT IN THE TABLE.

Sum 21.—Multiply 37 by 14.

$$\begin{array}{r}
 37 \\
 14 \\
 \hline
 148 \\
 37 \\
 \hline
 518
 \end{array}$$

Here let the little scholar observe, that he must place the unit 4 of the multiplier under the unit of the multiplicand, or sum at top multiplied ; and the ten 1, under the tens of the sum at top, 3 ; then he must say, 4 times 7 are 28, put down 8 and carry 2 ; 4 times 3 are 12, and 2 carried are 14, which put down will make 148. Then let him go to the next figure 1, which being a ten makes the figure multiplied not an unit, but places it among the tens, and therefore he always puts the product of the second figure under the tens, and says once 7 is 7, which he puts under the 4, and the other product of the 3 under the hundreds, as *ing multiplied by the 1 which is a ten, it*

makes 10 thirties which will be 300. Then the product is added together, and makes 518.

Now to prove a sum done this way, change the position of the multiplicand, the figures at top, and make them into the multiplier. Then work them thus :

$$\begin{array}{r}
 14 \\
 37 \\
 \hline
 98 \\
 42 \\
 \hline
 518
 \end{array}$$

The product of both being the same, the sum is right.

Sum 22.—Multiply 29 by 15.

Sum 23.—Multiply 33 by 17.

Sum 24.—Multiply 28 by 19.

Sum 25.—Multiply 39 by 22.

Sum 26.—Multiply 46 by 20. See what is said about doing sum 9, and do this in the same way.

Sum 27.—Multiply 54 by 30.

Sum 28.—Multiply 69 by 40.

Sum 29.—Multiply 99 by 50.

Sum 30.—Multiply 98 by 22.

Sum 31.—Multiply 99 by 36.

AMUSING SUMS FOR PRACTICE.



Sum 32.—If ten hens were to lay 30 eggs each in a month, how many would they lay in all ?

Here if you were to put down thirty eggs for the first hen, and thirty for the second, and so on to the tenth, you would find the answer by addition ; but as multiplication is a short way of doing addition, you must multiply the large sum by the small one, and you will find the answer.



Sum 33.—Some cruel boys went out to steal some poor birds' nests, and found 16 nests with six eggs in each ; how many eggs

did they take in all ? If the numbers in each nest were not equal, the sum must be done by addition.

Sum 34.—Sixty minutes make an hour, how many minutes then are there in nine hours ?

Sum 35.—Sixty seconds make a minute, how many seconds are there in ten minutes ?

Sum 36.—Twenty-four hours make a day and night, how many hours are there in five days and nights ?

Sum 37.—There are seven days in a week, and twenty-four hours in each day and night, how many hours are there then in a week ?

Sum 38.—Nine little boys went into a man's orchard to get apples ; they filled their hats and run off. When they counted their apples, they found that each boy had just 15 apples ; how many apples did they take in all ?

Sum 39.—Jane was a good girl, and when she was four years old, she could read very well ; so her mamma gave her a new book. She read just 17 pages a day, and in 7 days she finished her book ; how many pages were there in her book ?

Sum 40.—A man rode 45 miles a day for five days ; how many miles did he ride in all ?

DIVISION.

DIVISION is the separating of two or more things in any equal parts ; in other words, it will tell us how many times a small number is to be found in a great one.

Thus if you wish to know how many times 3 there are in 12, you will find by division that there are 4 times 3 in twelve.

Make twelve marks, thus,

III, III, III, III,
1 2 3 4

then count off three and make a comma, then three more and make another comma, and so on through all, then count the commas, and you will find there are four of them.

EXPLANATIONS OF THE DIVISION TABLE.**SECTION I.**

Two are in Four



Twice.

Two are in Six



Two

Two

Two

Three times.

Three are in Six



Three

Three

Twice.

Two are in Eight



Two

Two

Two

Two

Four times.

SECTION II.

Three are in Six,



Three

Three

Twice.

Four are in Eight,



Four

Four

Twice.

Two are in Three,



Once Two

One over.

Once and One over.

Three are in Eight,



Three

Three

Two over.

Twice and Two over.

DIVISION TABLE.

This Table will answer the Child when he would ask how many times any number is contained in another. This is the chief use of the Table. It is not wished that his memory should be burthened with it unless he learns it with pleasure and ease.

Lesson 1.

Numbers that divide without any remainder.

2 are in 2 once
2 are in 4 twice
2 are in 6 three times
2 are in 8 four times
2 are in 10 five times.
2 are in 12 six times.

Lesson 2. 3 are in 6 twice
3 are in 9 three times
3 are in 12 four times
4 are in 8 twice
4 are in 12 three times
5 are in 10 twice
6 are in 12 twice

Lesson 3.

Numbers that divide with remainder.

2 are in 3 once and one over
2 are in 5 twice and one over
2 are in 7 three times and one over
2 are in 9 four times and one over
2 are in 11 five times and one over

Lesson 4. 3 are in 4 once and one over
3 are in 5 once and two over
3 are in 7 twice and one over
3 are in 8 twice and two over
3 are in 10 three times and 1 over

Lesson 5. 4 are in 5 once and one over
4 are in 6 once and two over
4 are in 7 once and three over
4 are in 9 twice and one over
4 are in 10 twice and two over
4 are in 11 twice and three over

Lesson 6. 5 are in 6 once and one over
5 are in 7 once and two over
5 are in 8 once and three over
5 are in 9 once and four over
5 are in 11 twice and one over
5 are in 12 twice and two over

Lesson 7. 6 are in 7 once and one over
6 are in 8 once and two over
6 are in 9 once and three over
6 are in 10 once and four over
6 are in 11 once and five over

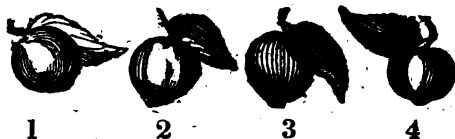
Lesson 8. 7 are in 8 once and one over
7 are in 9 once and two over
7 are in 10 once and three over
7 are in 11 once and four over
7 are in 12 once and five over

Lesson 9. 8 are in 9 once and one over
 8 are in 10 once and two over
 8 are in 11 once and three over
 8 are in 12 once and four over

Lesson 10. 9 are in 10 once and one over
 9 are in 11 once and two over
 9 are in 12 once and three over

Sum 1.—I want to divide four apples among four persons, A, B, C, and D ; then if I divide them thus, each will have the same number,

1 for A, 1 for B, 1 for C, 1 for D.



If I do the sum, I write down 4 and put 4 by its side, and divide it thus :

$$\begin{array}{r} 4 \overline{) 4} \\ \underline{4} \\ 0 \end{array}$$

I now say to myself, how many fours are there in 4 ? why only 1 to be sure ; then the 4 is in 4 once, and I put down 1 at the bottom.

Sum 2.—Suppose then you would divide eight eggs among four persons, John, James

Charles, and George, how many would each one have? We will take the eight eggs and make four equal divisions of them.

2 for John. 2 for James. 2 for Charles. 2 for George.



Now here are two a piece, count them and you will find 8. This we do thus in figures :

$$\begin{array}{r} 4 \overline{) 8} \\ 2 \end{array}$$

We draw a curve line between the divisor and the dividend, that is here the 4 and the 8, and we say to ourselves how many fours are there in eight, and we recollect our multiplication table that twice 4 are eight, or the division table, Lesson 2, 4 are in 8 twice; there are 2 fours in 8, and we put down 2 at the bottom.

Sum 3.—Divide 6 by 3.

Sum 4.—Divide 12 by 2.

Sum 5.—Divide 66 by 3. This is very easy, because the 6 of the units divided by 3 has 2 threes, and the 6 of the ten has the same, making 22.

Sum 6.—Now divide 39 by 3.

Divisor 3) 39 dividend

Quotient or answer 13

Here you find that there are 13 threes in 39 ; and you begin at the figure on your left, and say, the 3 is in 3 once, and put down 1 ; then you say the 3 is in 9 three times, and put down 3, which together make 13. The sum you are to divide is always called the *dividend* ; the sum you are to divide by is called the *divisor* ; and the sum which shows you how many times the divisor, or figure you divide by, is in the dividend or figure divided, is called the *quotient*, that is the answer.

Now to prove a sum in division, you must multiply the quotient or answer by the divisor or sum you divide by, and you put together what you before divided and have again the dividend. You divided 39 by 3, and 13 was the quotient ; then multiply the 13 by 3, and you get back 39 ; and if so you will prove that you have done the sum right, because you have your top figures you divided again. Example,

$$\begin{array}{r} 3 \overline{) 39} \\ 13 \\ 3 \\ \hline \end{array}$$

Proof 39

NOTE.—You must begin sums in Addition, Subtraction, and Multiplication, on your right hand, but sums in Division always on your left.

Sum 7.—Divide 63 by 3.

Sum 8.—Divide 99 by 3.

Sum 9.—Divide 84 by 4.

Sum 10.—Divide 88 by 2.

Sum 11.—Divide 93 by 3.

Sum 12.—Divide 91 by 3. Here will be an odd number remaining.

$$\begin{array}{r}
 \text{Dividend.} \\
 \text{Divisor } 3 \overline{) 91} \\
 \hline
 \text{Quotient } 30 \text{—} 1 \text{ remainder.} \\
 \phantom{\text{Quotient }} 3 \\
 \hline
 \phantom{\text{Quotient }} 91 \\
 \hline
 \end{array}$$

In the above sum you say 3 is in 9 three times and put down 3 ; then 3 is in 1, I cannot, for the dividend cannot be less than the divisor, then you put down 0, and put down the 1 for the remainder. Then to prove the sum, you multiply the quotient by the divisor 3, and take in the remainder to the units.

Sum 13.—Divide 87 by 4.

$$\begin{array}{r}
 4 \overline{) 87} \\
 \hline
 21 \text{—} 3 \\
 4 \\
 \hline
 87 \\
 \hline
 \end{array}$$

The above is done as Sum 12.

Sum 14.—Divide 65 by 3.

Sum 15.—Divide 87 by 2.

Sum 16.—Divide 49 by 4.

Sum 17.—Divide 78 by 4.

$$4 \overline{) 78}$$

$$\underline{19} - 2$$

$$4$$

$$\text{Proof } \underline{78}$$

In this sum you say the 4 is in 7 once and three over, and put down 1 and carry three; they are 3 tens, which you carry to the units, and then you say the 4 is in 38 nine times, for nine times 4 are 36 and 2 over. The 2 is put down for the remainder, and in doing the proof you take in the 2, and say 4 times 9 are 36 and 2 are 38, put down 8 and carry 3; 4 times one are 4 and 3 are 7, that is 78, the sum divided.

Sum 18.—Divide 97 by 4.

$$4 \overline{) 97}$$

$$\underline{24} - 1$$

$$4$$

$$\underline{97}$$

Here you say 4 is in 9 twice and 1 over, 4 is in 17 four times and 1 over, &c.

Sum 19.—Divide 75 by 4.

Sum 20.—Divide 59 by 2.

Sum 21.—Divide 98 by 5.

Sum 22.—Divide 69 by 7.

$$\begin{array}{r} 7 \overline{) 69} \\ \underline{63} \\ 6 \end{array}$$

Here the divisor is larger than the first figure of the dividend; and you must then take both figures, and say the 7 is in 69 nine times; nine times 7 are 63 and 6 over.

Sum 23.—Divide 87 by 9.

Sum 24.—Divide 78 by 8.

Sum 25.—Divide 64 by 5.

Sum 26.—Divide 69 by 7.

Sum 27.—Divide 280 by 3.

$$\begin{array}{r} 3 \overline{) 280} \\ \underline{21} \\ 93 \\ \underline{93} \\ 0 \end{array}$$

Proof 280

Here you say 3 is in 2 I cannot, then say 3 is in 28 nine times, 9 times 3 are 27 and 1 over; carry 1 to the 0 makes 10, then say 3 is in 10

three times, put down 3 and 1 goes to the remainder.

Sum 28.—Divide 275 by 5.

Sum 29.—Divide 323 by 3.

Sum 30.—Divide 3234 by 3.

Here carry on your remainders as with three figures.

Sum 31.—Divide 3847 by 2.

Sum 32.—Divide 3985 by 3.

Sum 33.—Divide 4984 by 7.

Sum 34.—Divide 8965 by 12.

$$\begin{array}{r}
 12 \overline{) 8965} \\
 \underline{747} 1 \\
 12 \\
 \underline{} \\
 8965
 \end{array}$$

Here you must say 12 is in 89 seven times, for 7 times 12 are 84, and 5 over; carry 5 and take up the 6, and say 12 is in 56 four times and 8 over, for 4 times 12 are 48, and 8 remains; 12 is in 85 seven times, for 7 times 12 are 84 and 1 remains, which put down to the remainder.

Sum 35.—Divide 8129 by 12.

Sum 36.—Divide 9654 by 11.

Sum 37.—Divide 8759 by 10.

To divide by 10, you must cut off the right hand figure, for the remainder, and all the other figures will be the quotient.

$$10 \overline{) 875} \mid 9$$

$$875 - 9$$

Cut off the 9 which will be the remainder, and the other figures 875 will be the quotient.

Sum 38.—Divide 6987 by 12.

Sum 39.—Divide 8999 by 12.

LONG DIVISION.

There is another way of dividing, called Long Division. You must put the divisor on the left hand, and the quotient, as you find it on the right hand of the dividend ; thus :

Sum 1.—Divide 452 by 2.

2) 452 (226 quotient.

$$\begin{array}{r}
 4 \qquad 2 \\
 \hline
 5 \quad 452 \text{ proof.} \\
 4 \qquad \cdot \\
 \hline
 12 \\
 12 \\
 \hline
 \end{array}$$

Begin at the left hand, and say 2 is in 4 twice, and put 2 in the quotient ; then multiply the divisor by the figure in the quotient,

2 times 2 are 4 ; place 4 under the 4 of the dividend, and subtract ; 4 from 4 nothing remains ; then bring down the next figure in the dividend, which is 5, and divide again ; 2 is in 5 twice, put 2 in the quotient, and multiply the divisor, 2 times 2 are 4 ; place 4 under the 5, and subtract, 4 from 5 there remains 1. Bring down the 2 in the dividend, and set it by the side of the 1 and you have 12. Divide again ; 2 is in 12 how many times ? 6 times ; put 6 in the quotient and multiply the divisor, 6 times 2 are 12.

To prove your sum, you must multiply the quotient by the divisor, and if it comes like the dividend, your sum is right.

Sum 2.—Divide 467 by 3.

3) 467 (155 quotient

3

16

15

17

15

2 remainder

In this sum you have the remainder 2 ; to prove it, you must first multiply the quotient,

DIVISION.

5, by the divisor 3, and then add the remainder 2; thus;

155 quotient
multiply 3 divisor

465

add 2 remainder

467 proof.

Sum 3.—Divide 736 by 4.

Sum 4.—Divide 840 by 5.

Sum 5.—Divide 6890 by 6.

Sum 6.—Divide 19726 by 7.

In doing this sum, you must take the first two figures together, 19; because you cannot divide 1 by 7; say 7 is in 19 twice, put 2 in the quotient, and proceed as before.

Sum 7.—Divide 18206 by 8.

Sum 8.—Divide 24079 by 9.

Sum 9.—Divide 35064 by 15.

15) 35064 (2337

30

50

45

56

45

114

105

9

You must consider how many times 15 are in 35 ; as there are twice 15 in 35 put 2 in the quotient, and multiply the divisor, twice 15 are 30 ; subtract 30 from 35, the difference is 5, which, if you have done your work right, will be less than the divisor ; bring down the next figure 0 to the 5 which makes 50, and divide as before.

Sum 10.—Divide 417208 by 26.

AMUSING SUMS FOR PRACTICE.

Sum 11.—I want to divide 300 plums among ten good boys : how many a piece should they have ?

Sum 12.—If I want to ride 620 miles in ten days, how many miles should I go in a day ?

Sum 13.—If I have 39 pears given to me, and am to give an equal number to my brother and to my sister, and to keep an equal number myself, how many a piece ought we to have ?

Sum 14.—A woman sent 640 eggs to market in four baskets ; she put the same number of eggs into each basket ; but one basket fell out of the waggon, and broke every egg in it : how many eggs were broken ?

ADDITION OF MONEY.

Now we will begin to reckon money, which is a little more difficult, and before we do it you must learn the money tables, at the end of the book.

PRACTICE IN ADDITION OF MONEY.

Put down in words the pence in 8 farthings.

Now remember your Rule, four farthings make one penny; then if four farthings make one penny, how many pence do twice four farthings make?

Put down in words the pence in 6 farthings.

Put down in words the pence in 7 farthings.

Put down in words the exact sum in shillings and pence which you have in thirteen pence. Here remember 12 pence is one shilling, and one penny more is one shilling and one penny.

Put down in words the sum in shillings and pence that you have in fourteen pence.

Put down in words the sum in shillings and pence that you have in seventeen pence.

Put down in words the sum in shillings and pence that you have in eighteen pence.

Set down in words the pounds and shillings you have in twenty-two shillings.

Set down in words the pounds and shillings you have in twenty-five shillings.

Set down in words the pounds and shillings you have in twenty-nine shillings.

MARKS IN SUMS OF MONEY.

Remember that a letter L with a stroke or two across it, thus £, means *a pound* in money; and is put either before a figure, thus £1, for one pound, or

£

over a figure, thus 1, one pound. So the marks
£ £

2, or £2, mean two pounds; 3, or £3, mean three pounds, and so on. If you ask why a letter is so used, it is because the Latin word for pound begins with an L (*Libra*.) and it has been a custom to use that mark.

s. used like L at the top or after a figure, means shillings, and is put for the first letter of the Latin word for shilling (*Solidus*;) and d. used in the same way, is put for pence, that is, for the Latin word for a penny (*Denarius*.)

Then one pound one shilling and one penny, must be written thus:

£. s. d.

1 1 1, or thus, £1. 1s. 1d.

The marks for a farthing, a halfpenny, and three farthings, are thus:

A Farthing $\frac{1}{4}$ or 1 qr.

A Half-penny ... $\frac{1}{2}$ or 2 qr.

Three-farthings $\frac{3}{4}$ or 3 qr.

Now if you can say your Money Table well, and know the marks well, you may try and cast up some money sums.

But here mind

HOW TO PUT DOWN THE SUMS OF MONEY.

You must put pounds under pounds, shillings under shillings, pence under pence, and farthings under farthings; because if you were to put any of the pounds under the shillings, and shillings under the pence, or pence under pounds, and so on, you would blunder sadly. Now suppose I want to reckon up the total of 5 pounds 4 shillings, and 5 pounds 5 shillings; if I mistake and put the 5 of the shillings under the pounds, I then put down nearly 5 pounds more than I have. You see this clearly. Then you put down your sum so:

£.	s.
5	4
5	5

And then draw a Line, thus _____

£10 9

And then add up the two; and say 5 and 4 make 9, which you put down under the shillings; then go to the pounds, and say 5 and 5 make ten, which you put down under the pounds, and then read, total, ten pounds nine shillings.

£. s. d.

Sum 1.—Add 1 2 3 one pound two shillings & three pence

And 2 1 2 two pounds one shilling & two pence

£3 3 5

Sum 2.

£. s. d.

2 4 9

3 6 2

Sum 3.

£. s. d.

9 1 2

2 4 3

Sum 4.

£. s. d.

6 7 8

5 11 3

The next sum is a little more difficult than those we have done. For there we had nothing to carry; but now mark, if the sum of the farthings makes as much as four, because four farthings make one penny, that sum must be carried to the pence, and if there be any

remainder, that must go to the farthings ; if the sum of the pence makes twelve, because twelve pence make one shilling, that sum must be added to the column of shillings ; and if the shillings make twenty, that sum must go to the pounds. And so for every 4 farthings you must carry a penny to the pence, for every 12 pence carry a shilling to the shillings, and for every 20 shillings carry a pound to the pounds, and put down the odd numbers.

	£.	s.	d.
<i>Sum 5.</i>	1	11	9
	2	10	4
	£4	2	1

Here we say, 4 and 9 are thirteen ; now 12 pence make 1 shilling, and 13 pence make 1 shilling and 1 penny ; so we put down the odd penny, and carry 1 for the 12 pence or 1 shilling to the next column ; and then we say, 1 we carry to 10 makes eleven, 11 and 11 at the top are twenty-two ; now 20 shillings make one pound, then carry the 1 to the pounds, and put down the odd shillings 2 ; and we say 1 that we carry to the 2 makes 3, and one at the top makes 4—four pounds two shillings and one penny.

<i>Sum 6.</i>	£.	s.	d.
	4	9	10
	5	12	4
	£10	2	2

Here we say 4 and 10 are fourteen; 14 pence make 1 shilling and two pence, put down 2 and carry 1 to the shillings; 1 and 12 are 13, and 9 are twenty-two, 22 shillings are 1 pound 2 shillings, put down 2 and carry 1; 1 and 5 are 6 and 4 are 10.—Ten pounds two shillings and two pence.

Now let the little scholar remember that 12 pence are a shilling, and that for every 12 in the pence he is to carry 1 to the shillings. Let him also remember that 20 shillings are a pound, and for every 20 shillings he is to carry 1 to the pounds; and that he can never write any higher sum under the pence column than 11, nor any higher sum under the shilling column than 19. If he writes 12 under the pence, he is wrong; he should, if he has just 12, put down 0 and carry 1, because 12 pence will make 1 shilling, which he must then add up with the shillings. If he writes 20 or 21, or any higher numbers under the shillings, he is wrong, for 20 shillings make a pound, and he must carry that pound to the pound column and add it up there, and leave an 0 under the shillings; or if it be 21, leave the odd 1 shilling under the shillings, and still carry the 1 to the pounds and

add it there. This being understood, now proceed :

	£.	s.	d.
<i>Sum 7.</i>	2	9	2
	1	1	3

	£.	s.	d.
<i>Sum 8.</i>	3	11	9
	5	10	11

Here remember that 11 and 9 make 20, and the pence table says 20 pence are one and eight pence ;—put down 8 and carry 1, and so on.

	£.	s.	d.
<i>Sum 9.</i>	5	2	6
	3	9	7

	£.	s.	d.
<i>Sum 10.</i>	6	8	0
	9	12	8

Here you have only 8 pence,—put down 8. You have none to carry. The shillings, too, make exactly 20, so you put down 0, having no remainder, and carry one to the pounds, for 20 shillings make 1 pound.

	£.	s.	d.
<i>Sum</i> 11.	3	7	10
	9	19	11

Here say 11 and 10 are 21 ; set down 21 by itself, and divide it by 12, because 12 pence make a shilling, thus,

$$\begin{array}{r} 12 \overline{) 21} (1 \\ \underline{12} \\ 9 \end{array}$$

Say how many times 12 in 21 ? once twelve : put 1 on the right hand, which is one shilling ; then subtract 12 from 21, and the difference is 9, which is nine pence ; place the 9 under 11 in the row of pence, and carry 1 ; then 1 and 19 are 20 and 7 are 27. Set down 27 and divide it by 20, because 20 shillings make 1 pound, thus,

$$\begin{array}{r} 20 \overline{) 27} (1 \\ \underline{20} \\ 7 \end{array}$$

Say how many times 20 in 27 ? once : put 1 on the right hand, and subtract 20 from 27 ; the difference is 7, which is 7 shillings ; put down 7 under the shillings, and carry 1 to the pounds. Then say 1 and 9 are 10 and 3 are 13.

	£.	s.	d.
<i>Sum 12.</i>	4	8	11
	9	13	2

	£.	s.	d.
<i>Sum 13.</i>	7	16	11
	6	6	7

	£.	s.	d.
<i>Sum 14.</i>	11	19	7
	6	4	8

	£.	s.	d.
<i>Sum 15.</i>	12	12	11
	13	2	5

Sum 16.—Add together 15*l.* 2*s.* 2*d.* and 16*l.* 3*s.* 9*d.*

You must write these as the others. Put down

	£.	s.	d.
	15	2	2
	16	3	9

Sum 17.—Add together 9*l.* 8*s.* 7*d.* and 16*l.* 15*s.* 11*d.*

Sum 18.—Add together 14*l.* 3*s.* 2*d.* and 16*l.* 13*s.* 1*d.*

Sum 19.—Add together 14*l.* 13*s.* 1*d.* and 15*l.* 16*s.* 11*d.*

	£.	s.	d.
<i>Sum 20.</i>	13	2	6
	6	3	10

NOTE.—Be very careful to put your units under the units, and the 6 under the 3 in the pounds, because a mistake here may make many pounds difference ; if the 6 were put under the 1 instead of under the 3, it would make 60, but it is 6 only in the units.

	£.	s.	d.
<i>Sum 21.</i>	6	12	1
	16	2	8
	5	3	9

Sum 22.—Add together 6*l.* 17*s.* 6*d.* and 5*l.* 16*s.* 2*d.* and 3*l.* 4*s.* 9*d.*

Sum 23.—Add together 5*l.* 19*s.* 1*d.* and 6*l.* 19*s.* 1*d.* and 4*l.* 3*s.* 2*d.*

	£.	s.	d.	qr.
<i>Sum 24.</i>	32	19	1	1
	41	12	1	0
	74	11	2	1

NOTE.—Four farthings make one penny. When the numbers in the shillings are high, it is an easy method to reckon up the units first, and then the tens in the shillings and pounds. In doing this sum say 1 farthing, and put down 1. Then say 1 and 1 are 2, put down 2 pence. Then say 2 and 9 are 11, put down 1 in the shillings, and carry 1 to the tens, and say 1 I carry to 1 make 2 and 1 at the top make 3, that is, with the 1 I put down, 31; 31 shillings are 1 pound 11, put down 11 carry 1. Then say 1 and 1 in the pounds make 2, and 2 are four; then 4 and 3 are 7, which make 74 pounds 11 shillings and 2 pence farthing.

	£.	s.	d.	qr.
<i>Sum 25.</i>	22	11	6	1
	11	10	5	1

Here I say 1 farthing and 1 farthing make 2 farthings, put down 2; as there is not 1 penny, there is nothing to carry. Then say 5 and 6 make 11, and go on as usual.

	£.	s.	d.	qr.
<i>Sum. 26.</i>	10	5	6	1
	11	6	1	2

This sum will make three farthings, 3 in the farthings ; nothing to carry, as it does not make a penny. Instead of writing the farthings 1 *qr.*, 2 *qr.*, you may use the farthing marks, thus;

£.	s.	d.
10	5	6 $\frac{1}{4}$
11	6	1 $\frac{1}{2}$

	£.	s.	d.
<i>Sum 27.</i>	15	16	2 $\frac{3}{4}$
	16	5	6 $\frac{1}{2}$

Here say 2 and 3 are 5, that is, 2 farthings which are in a halfpenny, and 3 farthings marked at top: now 4 farthings make 1 penny, and there is a farthing left, then put down 1 farthing, thus $\frac{1}{4}$; and carry one for the penny, and say 1 and 6 are 7, and 2 are 9, and so on as before.

ADDITION OF MONEY.

	£	s.	d.
Sum 28.	16	5	6½
	7	2	9½

Here you have two 3 farthings which make 6 farthings, then say 4 farthings make 1 penny, and put down 2 that remain with the halfpenny mark thus, ½, then carry 1, and so on.

	£.	s.	d.	qr.
Sum 29.	14	3	11	3
	15	6	1	3
	16	5	10	0

	£	s.	d.	qr.
Sum 30.	11	16	2	1
	12	15	2	1
	10	1	1	3

	£.	s.	d.	qr.
Sum 31.	11	2	6	2
	12	16	1	2
	13	10	2	1

	£.	s.	d.	qr.
<i>Sum 32.</i>	10	6	5	3
	11	5	6	3
	12	4	5	3

Here are three 3 *qr.* which make 9 farthings, and as 4 farthings make 1 penny, 8 farthings make 2 pence ; there will then be 2 to carry to the pence, and put down 1 farthing, thus, 1 *qr.*

Sum 33.—Add together 2*l.* 11*s.* 1*d.* 2 *qr.*, 66*l.* 5*s.* 2 *qr.* and 42*l.* 5*s.* 1*d.* 3 *qr.*

AMUSING SUMS IN ADDITION OF MONEY.

The following things are to be sold at the prices marked : What will they cost altogether ?

	£.	s.
A Hat - - -	1	1
A pair of Shoes	0	10
A Coat - - -	3	10
A pair of Boots	0	18

What is the amount of the following things ?

	<i>s.</i>	<i>d.</i>	<i>qr.</i>
A loaf of Bread -	0	9	2
A pound of Cheese	0	8	0
A pound of Candles	0	10	1
A loaf of Sugar -	7	6	1
A leg of Mutton -	5	6	3

If I received a present of a crown, and a half-crown yesterday, and three half-crowns to-day, how much have I got in the whole ?

Here observe a crown is five shillings ; half a crown is two shillings and sixpence.

Mr. Hosmer the toy merchant has sent in a bill for toys and books to your kind mamma ; how much is the amount ? It is as follows :—

	£.	<i>s.</i>	<i>d.</i>
A Horse and Cart - - - -	0	2	6
A Rocking Horse - - - -	1	10	0
A History of Birds and Beasts	0	3	6
A Bat and Ball - - - - -	0	1	6
A Doll for Miss Mary - - -	0	1	3
A little Bible - - - - -	0	0	9

After you have learned the Tables at the end of this book, you will be able to add to—

gether yards and quarters ; pounds and ounces ; hours and minutes, &c. ; always remembering to carry one if the sum of the first column equals one in the next, two if it equals two, and so on.

	<i>yd.</i>	<i>qr.</i>	<i>na.</i>
<i>Sum 34.</i>	24	3	1
	47	2	2
	72	1	3

In this sum begin at the nails, and say 2 and 1 are 3. Your table says, 4 nails make 1 quarter ; but as you have only 3 nails, they are less than 1 quarter, and you have none to carry. Set down 3 under the nails, and add the quarters thus, 2 and 3 are 5. Now 4 quarters make 1 yard ; you have then 1 yard and 1 quarter over ; place 1 under the quarters and carry 1 to the yards.

	<i>yd.</i>	<i>qr.</i>	<i>na.</i>
<i>Sum 35.</i>	37	2	1
	24	3	0
	16	1	2

	<i>gal.</i>	<i>qt.</i>	<i>pt.</i>
<i>Sum</i> 36.	24	1	1
	42	2	0
	38	3	1

Look at the table of Wine Measure, to know what to carry by.

SUBTRACTION OF MONEY.

SUBTRACTION of Money is done like common subtraction of figures. Write the pounds, shillings, and pence one under another, as in Addition. All the figures in the upper line, or largest sum, from which you are to take the smaller, must of course be greater than those of the lower line ; Example.

	£.	s.	d.	qr.
<i>Sum</i> 1.	8	8	6	3
	4	7	5	2
	4	1	1	1

Begin with the farthings. Here are 3 farthings in the top line, and only 2 farthings, or a half-penny in the lower line ; you therefore take 2 from 3 and 1 remains ; so in the pence, you take 5 from 6 and leave 1 remaining ; so in

the shillings, you take 7 from 8 and 1 remains; so in the pounds, 4 from 8 and 4 remain.

To prove the sum correct in Subtraction of Money, add the two bottom lines together, as in subtraction of simple figures, and if they come to the same sum as the top line, the sum is worked right; if not it is wrong. Let us prove the sum just done.

	£.	s.	d.	qr.
	8	8	6	3
Now add	4	7	5	2
and	4	1	1	1
They make the amount of the top line	8	8	6	3

Sum 2.—Subtract 5*l.* 7*s.* 6*d.* from 9*l.* 12*s.* 9*d.* 2 *qr.* Here say, take nothing from a halfpenny and a halfpenny remains, and put down 2 *qr.* and so on.

Sum 3.—Take 10*l.* 5*s.* 9*d.* 2 *qr.* from 12*l.* 6*s.* 10*d.* 3 *qr.*

Sum 4.—Take 19*l.* 6*s.* 10*d.* 3 *qr.* from 20*l.* 17*s.* 11*d.* 3 *qr.* Here say in the farthings, 3 from 3 and nothing remains, and so on.

Sum 5.—Subtract 20*l.* 9*s.* 11*d.* 2 *qr.* from 39*l.* 10*s.* 11*d.* 3 *qr.*

Sum 6.—Subtract or take 21*l.* 19*s.* 11*d.* 3 *qr.* from 54*l.* 19*s.* 11*d.* 2 *qr.*

Sum 7.—Subtract 29*l.* 16*s.* 3½*d.* from 30*l.* 14*s.* 2½*d.*

£.	s.	d.
30	14	2½
29	16	3½
	17	10½

Here say 3 farthings from 2 I cannot, but 3 from 4 and there remains 1, and 2 are 3. Here you see you borrow one penny, which you use as four farthings in the farthing-column, and having subtracted from that, you take in the top line and it makes a remainder of $\frac{3}{4}$; put down $\frac{3}{4}$: but as you have borrowed one from the pence, you must pay it, and so you go on and say 1 that I borrowed added to 3 makes 4, 4 from 2 I cannot, but 4 from 12 and there remain 8, and 2 [at top] are 10; put down 10, and carry 1 to the shillings; 1 borrowed, and carried to the 16 makes 17, take 17 from 14 I cannot, but take 17 from 20, and there remain 3, and 14 [at top] are 17, carry 1 borrowed to the pounds, then say 1 and 9 are 10, 10 from 0 and 0 remains, put down 0 and carry 1 [that is 1 for ten which must go to the tens in the pounds,] then say 1 and 2 are 3, 3 from 3 and there remains 0. There being no pounds remaining, and a cypher on the left hand being of no value, we do not put any thing down for the pounds, but merely write in figures seven-teen shillings and ten pence three farthings.

Sum 8.—Take 29*l.* 17*s.* 10*d.* from 54*l.* 16*s.* 9½*d.*

Sum 2.—Subtract 31*l.* 16*s.* 8½*d.* from 43*l.* 17*s.* 5¼*d.*

Sum 10.—Subtract 39*l.* 17*s.* 6½*d.* from 89*l.* 19*s.* 4*d.*

[If these sums are not sufficient in number for the little pupil's practice, let him work them over again; and also ask his teacher for other sums.]

AMUSING SUMS IN SUBTRACTION OF MONEY.

Sum 11.—If any one were to give me 50*l.* on condition that I should give 35*l.* to another person and keep the rest for myself, how much should I have left for my own share?

Here let the learner always remember to put the higher number over the lower sum, and subtract the least from the greater or he will be stopped in his reckoning.

Sum 12.—If I have 55*l.* 10*s.* and give 10*l.* to my tailor, and 2*l.* 4*s.* to my shoemaker, and 19*l.* 0*s.* 6*d.* to my carpenter, to pay their bills, how much shall I have left?

Here let the little scholar use his wits. Out of the 55*l.* 10*s.* he has to give a 10*l.* and a 2*l.* and a 19*l.* and odd shillings and pence. The money he has to give must be first added together, after which he must subtract the sum total of the addition from the money he has got, and he will find the answer.

Sum 13.—If I have 69*l.* and have to pay 32*l.* to one person, and 25*l.* to another, and 17*l.* to another, have I enough to pay them, or how much shall I want more ?

Here remember to make the addition as before, and to subtract the smaller sum from the larger one.

If you have learned the table of Dry Measure, you will know how to do these sums.

	<i>bu.</i>	<i>pk.</i>	<i>qt.</i>	<i>pt.</i>
Sum 14.	37	2	1	0
	18	0	7	2

	<i>bu.</i>	<i>pk.</i>	<i>qt.</i>	<i>pt.</i>
Sum 15.	129	0	7	1
	86	3	0	1

Sum 16.—A farmer put 58 bushels and 1 peck of corn into his garret, and afterwards sold 14 bushels and 3 pecks ; he gave 3 bushels and 2 pecks to his horse, and the rats eat up 1 peck ; how many bushels had he left ?

MULTIPLICATION OF MONEY.

Here you multiply the farthings first, then the pence, then the shillings, and then the pounds.

Sum 1.—Multiply $\begin{array}{r} \text{£.} \quad \text{s.} \quad \text{d.} \quad \text{qr.} \\ 2 \quad 3 \quad 2 \quad 1 \end{array}$ by 3.

$\begin{array}{r} \text{£}6 \quad 9 \quad 6 \quad 3 \end{array}$

Here you say 3 times 1 are 3 that is 3 $qr.$ Then 3 times 2 are 6, that is 6 pence. Then 3 times 3 are 9, that is 9 shillings. Then 3 times 2 are 6, that is 6 pounds.

Sum 2.—Multiply $\begin{array}{r} \text{£.} \quad \text{s.} \quad \text{d.} \quad \text{qr.} \\ 5 \quad 6 \quad 3 \quad 2 \end{array}$ by 5.

$\begin{array}{r} \text{£}26 \quad 11 \quad 5 \quad 2 \end{array}$

Here you carry just as in Addition of Money; Multiplication, as you have before been told, being only a short way to do Addition. You say 5 times 2 are 10, that is, 10 farthings; but you are to carry 1 for every 4 farthings to the pence column, as they make a penny, and therefore 8 out of the 10 farthings make 2 pence, which you carry to the pence and put down 2 for the 2 farthings that remain. Then you say 5 times 3 are 15, and the 2 I carry make 17; here you have one 12 pence in 17 pence, and as 12 pence make a shilling, you only put down the odd pence which will not make a shilling, and you set down 5 and carry 1. Then you say 5 times 6 are 30, and the one I carry makes 31. 31 shillings contain a 20, and as 20 shillings make a pound, put down

the odd shillings and carry the 1 pound to the pounds. Then say 5 times 5 are 25, and 1 to carry makes 26. That is twenty-six pounds eleven shillings and five pence halfpenny.

Just remember again that you carry 1 for every 4 in the farthings; you carry 1 for every 12 in the pence; and you carry 1 for every 20 in the shillings.

Remember also that you multiply first, and then add what you carry; as, for instance, you say first, 5 times 3 are 15, and 2 I carry make 17, and so on.

Sum 3.—Multiply 6*l.* 7*s.* 8*d.* 1*qr.* by 6.

Sum 4.—Multiply 8*l.* 10*s.* 1*d.* 3*qr.* by 4.

Sum 5.—Multiply 0*l.* 10*s.* 6*d.* 2*qr.* by 7.

Sum 6.—Multiply 5*l.* 6*s.* 3*d.* 3*qr.* by 9.

Sum 7.—Multiply 6*l.* 7*s.* 8*d.* 2*qr.* by 8.

Sum 8.—Multiply $\begin{array}{r} \text{£.} \quad \text{s.} \quad \text{d.} \quad \text{qr.} \\ 6 \quad 10 \quad 1 \quad 2 \end{array}$ by 4.

$$\begin{array}{r} \text{£}26 \quad 0 \quad 6 \quad 0 \\ \hline \end{array}$$

Here you have a 10 in the shillings which you multiply as if it were one figure. But in the next sum it will be necessary to multiply the two figures of the shillings separately, and you must do all so where two figures are in the shillings, though not where the cypher is, as in 10

Sum 9.—Multiply $\begin{array}{r} \text{£.} \quad \text{s.} \quad \text{d.} \quad \text{qr.} \\ 8 \quad 19 \quad 2 \quad 2 \end{array}$ by 5.

44 16 0 2

Here you begin at the farthings, and say 5 times 2 are 10; and put down 2 in the farthings, and carry 2 for the 2 fours in the 10; then you say 5 times 2 are 10, and 2 are 12, 12 pence make 1 shilling, therefore as you have 1 shilling and no remainder, you put down 0 in the pence and carry 1. Then you say (and it is wished you should mind this)—you say 5 times 9 are 45, and 1 to carry makes 46, put down 6 and carry 4 to the tens in the shillings, 5 times 1 are 5 and 4 are 9, that makes 96 shillings, that is 4 twenties and 16 over; then you put down 16 and carry 4 to the pounds, and say 5 times 8 are 40 and 4 are 44. That is forty-four pounds sixteen shillings and two farthings.

If you do not understand or cannot work this sum well, do it over 3 or 4 times. Then go on to

Sum 10.—Multiply 10*l.* 12*s.* 8*d.* 1*qr.* by 9.

Sum 11.—Multiply 15*l.* 16*s.* 7*d.* 3*qr.* by 8.

Sum 12.—Multiply 27*l.* 19*s.* 8*d.* 2*qr.* by 6.

Sum 13.—Multiply 29*l.* 16*s.* 5*d.* 2*qr.* by 10.

Sum 14.—Multiply 35*l.* 17*s.* 3*d.* 1*qr.* by 11.

Here remember your Multiplication Table of eleven times; if you have forgotten it; learn it well before you do the sum. Indeed this you should do with every line of the table as you want to use it.

Sum 15.—Multiply 12*l.* 19*s.* 8½*d.* by 12.

Sum 16.—Multiply 16*l.* 18*s.* 3¾*d.* by 12.

Sum 17.—Multiply 39*l.* 16*s.* 8½*d.* by 12.

Sum 18.—Multiply 54*l.* 3*s.* 0½*d.* by 14

When the number by which you are to multiply is higher than 12, you will even do the sum more easily than before, if you mind this rule; Think of any two numbers in the Multiplication Table that will make the number you want to multiply by. Now what will make 14? Why twice 7 are 14. Well, then, if you multiply the 54*l.* 3*s.* 0½*d.* by 7, you have 7 times its amount; and then multiply that 7 times the amount by 2, you double it, and make 14 times the amount, which was what you wanted. Now we will do it.

£.	s.	d.
54	3	0½
		7
379	1	3½
		2
£758	2	7

If I want to multiply by 24, I may do it by 8 and 3, because 3 times 8 are 24; or by 6 and 4, because 4 times 6 are 24; or by 12 and 2, because twice 12 are 24; though the former are most easy.

Sum 19.—Multiply 24*l.* 6*s.* 9*d.* 1*qr.* by 13. Here is an odd number, not to be found in the Multiplication Table. Well, then, take the nearest to it, and multiply by 12, and add one line of the 24*l.* 6*s.* 9*d.* 1*qr.* to the total; or multiply by 6 and by 2, because twice 6 are 12, and add one line then. Thus:

£24	6	9 $\frac{1}{4}$	
		6	
146	0	7 $\frac{1}{2}$	
		2	
292	1	3	
24	6	9 $\frac{1}{4}$	Top line added
£316	8	0 $\frac{1}{4}$	

Then the line to be multiplied added once to the total makes the sum required. Twice 6 are 12, and one makes 13.

If you want to multiply by 38, you may do it by 6 times 6, and then multiply the top line by 2, and add it as is just done with 1 in the sum above. So if you have to multiply by 59, you must do the sum by 7 times 8, which make 56, and multiply the top line by 3 and add it.

Sum 20.—Multiply 20*l.* 10*s.* 6*d.* by 17.

Sum 21.—Multiply 21*l.* 16*s.* 3*d.* by 38.

Sum 22.—Multiply 23*l.* 15*s.* 4*d.* by 59.

Sum 23.—Multiply 29*l.* 16*s.* 3*d.* by 21.

Sum 24.—Multiply 30*l.* 0*s.* 6*d.* by 22.

Sum 25.—Multiply 26*l.* 3*s.* 9*d.* by 17.

Sum 26.—Multiply 30*l.* 2*s.* 6*d.* by 13.

Sum 27.—Multiply 59*l.* 3*s.* 4*d.* 2*qr.* by 38.

Sum 28.—Multiply 39*l.* 3*s.* 8*d.* 1*qr.* by 59.

Sum 29.—Multiply 59*l.* 6*s.* 4*d.* 2*qr.* by 84.

AMUSING SUMS IN MULTIPLICATION OF MONEY.

Sum 30.—If the tallow-chandler sends in 10 pounds weight of candles, at *8d. 2qr.* per pound, how much will the whole cost?

Put down the price per pound	d.	qr.
	..8	2
Multiply by ten		10

Sum 31.—If I save 1d. 2qr. per day, that is each day, how much shall I have saved in 30 days? I have to find 30 times 1d. 2qr. d. qr.

Set down $\begin{array}{r} 12 \\ 10 \\ \hline 3 \end{array}$

Multiply by 30, (do it by ten and three as three times 10 are thirty)

Sum 32.—If the butcher has sent in 28lbs. of beef, at $10\frac{1}{2}d.$ per pound weight, how much will the whole come to? [Do it by 7 times 4, or 4 times 7, as both make 28.]

Sum 33.—If the dairy-man has sent 39lbs. of butter at $11\frac{1}{2}d.$ per pound, how much is the amount of his bill?

You must learn the table of Troy Weight, and then you will know what to carry by in doing these sums.

	<i>lb.</i>	<i>oz.</i>	<i>pwt.</i>	<i>gr.</i>	
Sum 34. —Multiply	27	8	15	22	by 7.

	<i>lb.</i>	<i>oz.</i>	<i>pwt.</i>	
Sum 35. —Multiply	125	10	18	by 9.

Sum 36.—A Jeweller received from London six boxes of gold rings and pins; each box weighed 7 pounds 9 ounces 12 pennyweights and 16 grains; what was the weight of all the boxes?

DIVISION OF MONEY.*

DIVISION OF MONEY is the very reverse or opposite to **Multiplication of Money**. In **Multiplication** we make a sum many times more; in **Division** we make it many times less. For instance, if we want to give 20*l.* each to four

* In working this and simple Division, the Author has employed the usual terms of arithmetic, as 3 is in 6, &c. meaning *the figure* or collected sum of 3; if *the number* in detail be meant, then it is correct to say 3 are in 6 twice, &c. as in the Division Table.

people, and would know how much money we must have in the whole to do it, we multiply 20 by 4, and find we must have 80*l.* which is 4 times as much; but if we want to divide 20*l.* among four people, we divide it by four, and find we must give them 5*l.* each, which is four times less.

Sum 1.—Divide 10*l.* 10*s.* 10*d.* by 2.

Here begin at the pounds. Mark, in *Addition*, *Subtraction*, and *Multiplication*, you begin the sum at the farthings and pence, but in *Division* at the pounds.

	£.	s.	d.
Divisor 2)	10	10	10

Quotient ...	£5	5	5	Dividend or answer.
--------------	----	---	---	---------------------

Here you say, beginning at the pounds, the 2 is in 10 five times, then the same at the shillings, and then the same at the pence, putting the answer at the bottom.

Now to prove this sum, multiply what you have done by 2, and you bring it the same as the top line, which shews it is right.

	£.	s.	d.
	5	5	5
Multiplied by			2

Makes ...	10	10	10
-----------	----	----	----

Sum 2.—Divide 12*l.* 6*s.* 8½*d.* by 2.

Sum 3.—Divide 20*l.* 18*s.* 10½*d.* by 2.

Sum 4.—Divide 40*l.* 12*s.* 8*d.* by 4.

Sum 5.—Divide 50*l.* 15*s.* 5*d.* by 5.

Sum 6.—Divide 55*l.* 18*s.* 7¾*d.* by 3.

This requires some explaining. We do it thus :

	£.	s.	d.	
	3)	55	18	7¾—1 remainder
Answer		18	12	10½ or quotient
			3	
Proof		£55	18	7¾

Here we say 3 is in 5 once, put down 1 and carry 2 over ; these are two tens, therefore we carry the 2 tens or 20 to the 5, and say 3 is in 25 eight times and one over, put down 8 and carry 1. The 1 we carry to the shillings is a pound, which makes 20 shillings, and as we have shillings to divide next, we say 20 added to 18 make 38 ; the 3 is in 38 twelve times and 2 over, we then put down 12 and carry 2 ; the 2 we carry are shillings, but as we have to divide pence, these we must make into 24 pence, the value of two shillings, and say 24 added to 7 pence make 31, the 3 is in 31 ten times and 1 over, put down 10 and carry 1 ; the one we carry is one penny, this penny we must add to the farthings, but we must make it first into farthings to divide it along with the farthings, and we therefore carry four for the one, and

say 4 and 3 are 7 [that is 7 farthings,] the 3 is in 7 twice and 1 over. Here put down $\frac{1}{2}$ [or 2 farthings,] and set down the 1; that is, 1 farthing over at the right side of the top line as a remainder.

To prove the sum, multiply the answer by the figure which you divided by, and you make all the divided parts again into one, which brings the amount of the top line back again.

Sum 7.—Divide 83*l.* 2*s.* 6*d.* by 7.

Sum 8.—Divide 94*l.* 16*s.* 8 $\frac{3}{4}$ *d.* by 5.

Sum 9.—Divide 110*l.* 1*s.* 10 $\frac{1}{2}$ *d.* by 6.

Sum 10.—Divide 157*l.* 0*s.* 0 $\frac{1}{2}$ *d.* by 4.

Here we do the sum thus :

$$\begin{array}{r}
 \text{£.} \quad \text{s.} \quad \text{d.} \\
 4 \overline{) 157 \quad 0 \quad 0\frac{1}{2}} \\
 \hline
 39 \quad 5 \quad 0.—2 \\
 4 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 \text{Proof} \quad \text{£}157 \quad 0 \quad 0\frac{1}{2} \\
 \hline
 \end{array}$$

Here we say 4 is in 15 three times and 3 over, and put down 3 and carry 3; the 3 carried stands for 3 tens, 3 tens are 30 and 7 are 37, the 4 is in 37 nine times and 1 over; one pound we carry makes 20 shillings, the 4 is in 20 five times. There are no pence to divide, and so we put down 0. Then we come to the farthings; and as 4 will not go once in 2, we put down a dot, and set 2 down as a remainder.

Sum 11.—Divide 159*l.* 0*s.* 0 $\frac{1}{4}$ *d.* by 5.

Sum 12.—Divide 237*l.* 0*s.* 0 $\frac{1}{2}$ *d.* by 6.

Sum 13 —Divide 54*l.* 1*s.* 1*d.* 2 *qr.* by 9.

Here the shillings will have none to divide ;
you must therefore do this sum in this way :—

	£.	s.	d.	qr.
9)	54	1	1	2
	£6	0	1	2
				9

Proof £54 1 1 2

Here you say 9 is in 54 six times, put down 6. Then you have none left to carry, and you say 9 is in 1 will not go, but put down 0 and carry 1 that remains not divided ; the 1 you carry is a shilling, which you call 12 pence and carry to the pence, adding it to the 1 in the pence, and you then say 12 and 1 are 13, the 9 is in 13 once, and 4 over, put down 1 and carry 4 to the farthings ; this is 4 pence which makes 16 farthings, and 2 in the farthings are 18, the 9 is in 18 twice, put down 2. Multiply by 9, and you get back the sum you divided, and prove it is worked right.

Sum 14.—Divide 55*l.* 2*s.* 2*d.* 1 *qr.* by 9.

Sum 15.—Divide 74*l.* 8*s.* 5*d.* 2 *qrs.* by 12.

Sum 16.—Divide 175*l.* 1*s.* 6*d.* by 20.

As the sum by which we are to divide, (that

is the *divisor*,) is higher than 12, we must do it thus ; and all sums with above 12 in the divisor must be done in the same way :

$$\begin{array}{r}
 \begin{array}{r}
 \text{£.} \quad \text{s.} \quad \text{d.} \quad \text{qr.} \\
 5 \overline{) 175} \quad 1 \quad 6 \quad 0 \\
 \hline
 4 \overline{) 35} \quad 0 \quad 3 \quad 2-2 \\
 \hline
 \text{Ans.} \quad \text{£}8 \quad 15 \quad 0 \quad 3-2 \\
 \phantom{\text{Ans.}} \phantom{\text{£}} 4 \\
 \hline
 \phantom{\text{Ans.}} \phantom{\text{£}} 35 \quad 0 \quad 3 \quad 2 \\
 \phantom{\text{Ans.}} \phantom{\text{£}} 5 \\
 \hline
 \text{Proof} \quad \text{£}175 \quad 1 \quad 6 \quad 0
 \end{array}
 \end{array}$$

Here we have had to divide by 20, then we take the two nearest figures that multiplied together make 20 in the Multiplication Table, and we say 5 times 4 are 20. Then we divide by these two figures—we may divide by either first. Then to prove that the sum is right, multiply it back, beginning with the divisor *you used last*, which in the sum above is 4, and taking in that line the last remainder, if there be any ; in this sum the last remainder is 2, that is $\frac{1}{2}$; then multiply that product by the upper divisor, which in this sum is 5, and take in the remainder on the top line, if any, which in this sum is 2 again, that is $\frac{1}{2}$, and if you have the top line produced again, the sum is right.

Here the top line is produced again, which is 175*l.* 1*s.* 6*d.* then you prove that your answer is right, which is 8*l.* 15*s.* 0 $\frac{1}{2}$ *d.*

The sum may be proved by multiplying by either figure first, but as it will sometimes make a farthing or two difference in the proof, on account of the remainders, the most sure way is to begin with the last divisor, and then take the top one.

Sum 17.—Divide 120*l.* 6*s.* 8*d.* by 32.

Sum 18.—Divide 321*l.* 4*s.* 9*d.* by 50.

AMUSING SUMS IN DIVISION OF MONEY.

Sum 19.—If I have 560*l.* a year income, what is that per month, reckoning 12 months in the year? Divide by 12.

Sum 20.—A lady left 120*l.* a year to be divided every new year's day among 14 poor persons; how much had they apiece?

Sum 21.—A farmer sold 81 bushels of wheat for 30*l.* 7*s.* 6*d.*; how much did he get a bushel for his wheat?

Now look at the table of Time, and then do these sums.

Sum 22.—Divide 142 years 8 months by 48.

Sum 23.—Divide 345 days 21 hours 37 minutes by 60.

Sum 24.—A shoemaker made 132 pair of boots in 13 weeks 4 days 5 hours and 20 min-

PRACTICE ON THE RULES.

1; how many hours did it take him to make
air of boots, calling 12 hours a day?

GENERAL PRACTICE ON ALL THE RULES.

Num 1.—Add together 19, 16, 54, 101, 123,
How much is the whole?

Num 2.—Subtract 1020 from 1480, and
what remains?

Num 3.—Multiply 230 by 7, what is the pro-
duct?

Num 4.—Divide 897 by 5, what is the quo-
tient or answer?

Num 5.—Add together 12*l.* 13*s.* 1½*d.*, 6*l.* 3*s.*
7*l.* and 16*l.* 8*s.* 5½*d.* What is the total?

Num 6.—Subtract 127*l.* 5*s.* from 293*l.* 1*s.*
and what remains?

Num 7.—Multiply 24*l.* 6*s.* 6*d.* by 6, and what
is the product?

Num 8.—Divide 681*l.* 2*s.* 6*d.* by 4, and what
is the quotient?

Num 9.—Divide 829*l.* 7*s.* 8½*d.* by 14, and
what is the quotient?

Num 10.—Add together 27 yards, 14 yards
et, 1 foot 9 inches, 2 feet 7 inches, and 10
les.

Num 11.—Add together 23 days 14 hours
minutes, 38 days 9 hours 7 minutes, 23
rs 19 minutes 35 seconds, 8 hours 59 min-
47 seconds, 37 minutes 21 seconds.

Sum 12.—Subtract 21 tons 14 hundreds 1 quarter 25 pounds, from 30 tons 7 hundreds 3 quarters 18 pounds.

Sum 13.—Subtract 8 ounces 2 drams 1 scruple 15 grains, from 10 ounces 7 drams 1 scruple 8 grains.

Sum 14.—Multiply 25 pounds 10 ounces 16 pennyweights 21 grains by 7.

Sum 15.—Multiply 24 gallons 3 quarts 1 pint 2 gills by 8.

Sum 16.—Divide 27 bushels 2 pecks 6 quarts 1 pint by 6.

Sum 17.—Divide 39 yards 3 quarters 2 nails by 9.

HOW TO WRITE A BILL.

MISS EMMONS,

To H. & F. J. HUNTINGTON, Dr.

		£.	s.	d.
1829.				
Sept 1.	To 1 Ream of Paper -	1	1	0
	To 1 Stick of Wax -			6
	To 1 Prayer Book -		5	0
	To 1 Bible in Morocco		7	6
Oct. 2.	To 1 Testament -		3	6
	To 1 Pocket Book -		3	0
	To 1 School Dictionary		2	6
		£2	3	0

In the United States, accounts are generally kept in *dollars* and *cents*, and bills are written thus:

W. W. TURNER,

To J. BELDEN, Dr.

1829.

Sept. 3.	To a load of wood	-	\$4,25
"	To a bushel of apples	-	37
Oct. 7.	To a load of hay	-	10,54
Nov. 6.	To a barrel of cider	-	90

 \$16,06

Received payment, Hartford, Nov. 9, 1829.

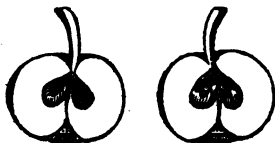
J. BELDEN.

FRACTIONS.

A FRACTION is any number less than one.—
If an apple is cut into two equal parts, each



of these parts is a fraction, or half, and is expressed thus $\frac{1}{2}$, which is called one half.



*Divide an orange into three equal parts, one of
se is called a third, and is expressed thus $\frac{1}{3}$.*

Here is a pipe broken into several pieces ; each of these pieces is a *fraction*.



If you count the pieces you will see there are ten of them, and all these ten pieces when put together make one whole pipe.

The figure under the line is called the *Denominator*, and it shows how many equal parts a thing is divided into.

This pipe is divided into 10 pieces. The figure under the line then will be 10.

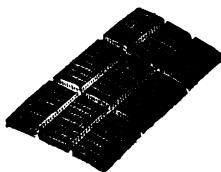
The figure above the line is called the *Numerator*, and it shows how many of these pieces or parts of a thing is meant.

If I write $\frac{1}{10}$ of a pipe, it means the pipe is broken into 10 equal pieces and I take one of them.

If I say I have $\frac{3}{10}$ of a pipe in my hand, I mean the pipe is broken into 10 equal pieces and I have 3 of them.

1 piece of the pipe is	$\frac{1}{10}$ one tenth,
2 pieces together	are $\frac{2}{10}$ two tenths,
3 pieces	are $\frac{3}{10}$ three tenths,
4 pieces	are $\frac{4}{10}$ four tenths,
5 pieces	are $\frac{5}{10}$ five tenths,
6 pieces	are $\frac{6}{10}$ six tenths,
7 pieces	are $\frac{7}{10}$ seven tenths,
8 pieces	are $\frac{8}{10}$ eight tenths,
9 pieces	are $\frac{9}{10}$ nine tenths,
10 pieces	are $\frac{10}{10}$ ten tenths, or
1, because they make the whole pipe.	

Here is a large card of gingerbread cut into 9 equal parts.



If Charles takes two of these pieces, he will have two ninths of the whole card, and you must write it so, $\frac{2}{9}$; because the gingerbread is cut into 9 equal parts, you must put 9 under the line for the denominator; and because Charles takes 2 of these pieces, you must put 2 above the line for the numerator.

ADDITION OF FRACTIONS.

When the denominators are the same, you can add fractions, by adding the numerators; then place the sum over the common denominator.

Sum 1.—Add $\frac{2}{9}$ and $\frac{3}{9}$ together.

Set down the figures above the line one under the other and add them thus,

$$\begin{array}{r} 2 \\ 3 \\ \hline 5 \end{array} \left. \vphantom{\begin{array}{r} 2 \\ 3 \\ \hline 5 \end{array}} \right\} \begin{array}{l} \text{numerators} \\ \\ \text{sum.} \end{array}$$

Place the sum over the denominator, 9, and you have the answer, $\frac{5}{9}$, five ninths.

You will see this is true, if you take 2 pieces of the gingerbread, which are $\frac{2}{9}$ of it, and then 3 pieces more which are $\frac{3}{9}$ of it, and count them all together, one, two, three, four, five pieces, which are $\frac{5}{9}$ or five ninths of the whole card of gingerbread.

Sum 2.—Add $\frac{2}{9}$ and $\frac{1}{9}$ together.

Sum 3.—Add $\frac{1}{9}$, $\frac{2}{9}$ and $\frac{2}{9}$ together.

Sum 4.—How many ninths are there to a thing? How many pieces of gingerbread in the whole card?

Sum 5.—If I cut an orange into nine pieces, and give Mary 5 pieces and George 3 pieces, how many ninths of the orange shall I give away?

Sum 6.—John had $\frac{1}{8}$ of a dollar, Charles had $\frac{3}{8}$ of a dollar, and William had $\frac{2}{8}$ of a dollar; what part of a dollar had they all?

Sum 7.—A merchant went from Hartford to Boston to buy goods; his journey took him $\frac{4}{7}$ of a week, he staid in Boston $\frac{2}{7}$ of a week, and returned home in $\frac{1}{7}$ of a week; how long was he gone?

SUBTRACTION OF FRACTIONS.

Where the denominators are the same, you can subtract fractions by taking the smallest numerator from the other; and place the dif-

ference above the line and the denominator under the line.



Here is a nice pie cut into seven equal parts ; one of these pieces is called a seventh, and is written thus $\frac{1}{7}$; and the whole seven pieces together $\frac{7}{7}$ seven sevenths or 1, because they make the whole pie. Now if you take out three pieces of the pie there will be four pieces left, that is $\frac{3}{7}$ subtracted from $\frac{7}{7}$ there remain $\frac{4}{7}$.

Sum 1.—Subtract $\frac{3}{7}$ from $\frac{5}{7}$.

$$\begin{array}{r} 5 \text{ largest numerator} \\ 2 \text{ smallest numerator} \\ \hline 3 \text{ difference.} \end{array}$$

Place the difference 3 over the denominator 7, and you have the answer, $\frac{3}{7}$.

Sum 2.—Subtract $\frac{1}{7}$ from $\frac{4}{7}$.

Sum 3.—Subtract $\frac{2}{7}$ from $\frac{4}{7}$.

Sum 4.—Subtract $\frac{2}{8}$ from $\frac{5}{8}$.

Sum 5.—Subtract $\frac{5}{12}$ from $1\frac{1}{12}$.

Sum 6.—Subtract $\frac{4}{7}$ from $\frac{7}{7}$.

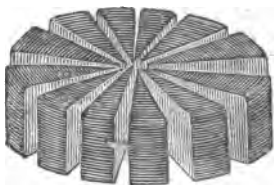
Sum 7.—If I take out six pieces, or $\frac{6}{7}$ of the pie, and give away three pieces, or $\frac{3}{7}$ of it, how many sevenths or pieces should I have left ?

Sum 8.—A little boy's papa gave him $\frac{1}{4}$ of a dollar, and he gave his sister $\frac{2}{5}$ of a dollar, and paid $\frac{1}{5}$ of a dollar for the "Child's Arithmetic;" how much money had he left?

MULTIPLICATION OF FRACTIONS.

A fraction cannot properly be said to be multiplied by another fraction, but it may be multiplied by a number larger than 1.

Here is a cheese, cut into 12 equal parts.



One of these pieces would be written $\frac{1}{12}$, and may be multiplied by 2, 3, 4, and so on.

Sum 1.—Multiply $\frac{1}{12}$ by 3.

We wish to take $\frac{1}{12}$ three times, thus $\frac{1}{12}$, $\frac{1}{12}$, $\frac{1}{12}$; which added together, make $\frac{3}{12}$. You see the numerator is increased, while the denominator is not changed. If you multiply the numerator by 3, you will have the same answer, thus;

$$\begin{array}{r}
 1 \text{ numerator, that is 1 twelfth} \\
 3 \text{ multiplier} \\
 \hline
 3 \text{ twelfths.}
 \end{array}$$

Say three times 1 are 3 ; put this over the denominator and you have the answer $\frac{3}{12}$ three twelfths.

Sum 2.—Multiply $\frac{2}{12}$ by 4.

Take out two pieces of the cheese together, 4 times ;

$$\begin{array}{r}
 2 \text{ pieces once} \\
 2 \text{ " twice} \\
 2 \text{ " three times} \\
 2 \text{ " four times} \\
 \hline
 \end{array}$$

8 pieces which are 8 twelfths $\frac{8}{12}$.

This I do by addition ; it may be done much quicker by multiplying the numerator by 4, thus ;

$$\begin{array}{r}
 2 \text{ twelfths} \\
 4 \\
 \hline
 8 \text{ twelfths}
 \end{array}$$

Set 8 over the denominator 12, and you have the product $\frac{8}{12}$.

Sum 3.—Multiply $\frac{3}{12}$ by 3.

Sum 4.—Multiply $\frac{4}{6}$ by 4.

Sum 5.—Multiply $\frac{5}{12}$ by 6.

Sum 6.—Multiply $\frac{4}{20}$ by 4.

Sum 7.—Multiply $\frac{5}{12}$ by 3.

Here you will have the answer $1\frac{1}{2}$. If you will count the pieces into which the cheese is cut, you will see there are 12 of them, or twelve twelfths, $1\frac{2}{2}$, which are the same as 1, because they make 1 cheese. In 15 twelfths, are once 12 twelfths, and 3 twelfths over : $1\frac{1}{4}$ then is the same as 1 and $\frac{3}{12}$, or $1\frac{1}{4}$.

Sum 8.—Multiply $\frac{3}{8}$ by 8.

Sum 9.—Multiply $\frac{6}{10}$ by 7.

Sum 10.—A nice water-melon was cut into 20 equal pieces, and set on a table where were 6 greedy children, each of whom snatched off 2 pieces, or $\frac{2}{20}$ of it ; how many twentieths of the melon did they all take ?

DIVISION OF FRACTIONS.

We find how many times one fraction is contained in another or in a whole number by Division.

Here is an apple.



We wish to know how many halves it has, or how many times $\frac{1}{2}$ there are in 1.

Here we have it cut in the middle, and we see there are 2 halves.



So we know that $\frac{1}{2}$ is in 1 twice

$\frac{1}{2}$	"	2	four times
$\frac{1}{2}$	"	3	six times
$\frac{1}{2}$	"	4	eight times
$\frac{1}{2}$	"	5	ten times

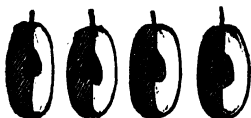
We wish to know how many times $\frac{1}{3}$ there are in 1. Here is an apple cut into thirds.



We see there are 3 of them, so we know that

	$\frac{1}{3}$	is in 1	three times
and	$\frac{1}{3}$	"	2 six times
	$\frac{1}{3}$	"	3 nine times
	$\frac{1}{3}$	"	4 twelve times
	$\frac{1}{3}$	"	5 fifteen times

How many times $\frac{1}{4}$ are there in 1? Here is an apple cut into quarters or fourths.



And there are 4 of them; then

	$\frac{1}{4}$	is in	1	four times
and	$\frac{1}{4}$	"	2	eight times
	$\frac{1}{4}$	"	3	twelve times
	$\frac{1}{4}$	"	4	sixteen times
	$\frac{1}{4}$	"	5	twenty times

We can always find how many times a fraction is contained in a whole number by multiplying it by the denominator, and dividing by the numerator if it is greater than 1.

Sum 1.—Divide 5 by $\frac{1}{4}$.

Here we wish to know how many times $\frac{1}{4}$ there are in 5. Set down 5 and multiply it by the denominator, 4, thus;

$$\begin{array}{r} 5 \\ 4 \\ \hline 20 \end{array}$$

Which means there are 20 times $\frac{1}{4}$, or 20 quarters in 5.

Sum 2.—Divide 8 by $\frac{1}{4}$.

Sum 3.—Divide 9 by $\frac{1}{4}$.

Sum 4.—Divide 12 by $\frac{1}{3}$.

Sum 5.—Divide 7 by $\frac{3}{9}$.

In this sum you must multiply by the denominator 9, and divide by the numerator 3, thus ;

$$\begin{array}{r} 7 \\ 9 \\ \hline 3 \overline{) 63} \\ \hline 21 \end{array}$$

9 times 7 are 63, then divide by 3 the numerator ; 3 is in 6 twice, put down 2, and 3 is in 3 once, 21, which means $\frac{3}{9}$ is contained in 7 twenty-one times.

Sum 6.—Divide 12 by $\frac{4}{5}$.

Sum 7.—Divide 15 by $\frac{5}{8}$.

We sometimes wish to know how many times one fraction is contained in another larger one.

How many times $\frac{1}{4}$ are there in $\frac{1}{2}$? The apple in the last picture is divided into quarters or fourths, and you see there are 4 of them ; in half of the apple there are two quarters, so there are twice $\frac{1}{4}$ in $\frac{1}{2}$.

Sum 8.—Divide $\frac{3}{4}$ by $\frac{1}{4}$.

In this sum the denominators are alike, and all you have to do is to divide one numerator by the other, thus ;

$$\begin{array}{r} 1 \overline{) 3} \\ \underline{3} \\ 0 \end{array}$$

1 is in 3 three times, which means $\frac{1}{4}$ is in $\frac{3}{4}$ three times.

Sum 9.—Divide $\frac{3}{8}$ by $\frac{2}{9}$.

Sum 10.—Divide $\frac{6}{7}$ by $\frac{2}{7}$.

Sometimes we wish to take a part of a fraction, and know how much it is. We wish to take $\frac{1}{2}$ of $\frac{2}{3}$. Here we must divide $\frac{2}{3}$ into 2 equal parts, and take 1 of them, $\frac{1}{3}$.

Sum 11.—How much is $\frac{1}{3}$ of $\frac{3}{4}$?

You must divide $\frac{3}{4}$ into 3 equal parts, $\frac{1}{4}$, $\frac{1}{4}$, $\frac{1}{4}$, and take 1 of them, $\frac{1}{4}$.

This you can always do by multiplying the numerators together for a new numerator, and the denominators for a new denominator.

Sum 12.—How much is $\frac{1}{3}$ of $\frac{1}{2}$?

$$\begin{array}{rcl} \begin{array}{l} 1 \\ 1 \end{array} \left. \vphantom{\begin{array}{l} 1 \\ 1 \end{array}} \right\} \text{numerators} & & \begin{array}{l} 6 \\ 2 \end{array} \left. \vphantom{\begin{array}{l} 6 \\ 2 \end{array}} \right\} \text{denominators} \\ \hline 1 & & 12 \end{array}$$

$\frac{1}{12}$ one twelfth.

Sum 13.—How much is $\frac{2}{3}$ of $\frac{4}{5}$?

$$\begin{array}{rcl} \begin{array}{l} 2 \\ 4 \end{array} \left. \vphantom{\begin{array}{l} 2 \\ 4 \end{array}} \right\} \text{numerators} & & \begin{array}{l} 3 \\ 5 \end{array} \left. \vphantom{\begin{array}{l} 3 \\ 5 \end{array}} \right\} \text{denominators} \\ \hline 8 & & 15 \end{array}$$

$\frac{8}{15}$ eight fifteenths.

Sum 14.—How much is $\frac{3}{4}$ of $\frac{4}{7}$?

Sum 15.—How much is $\frac{3}{7}$ of $\frac{5}{8}$?

ARITHMETICAL TABLES.

Money.

4 farthings (<i>qr.</i>)	make 1 penny,	<i>d.</i>
12 pence	1 shilling,	<i>s.</i>
20 shillings	1 pound, £. or <i>l.</i>	

English money is called sterling. An English shilling is about 22 cents; an English pound is 4 dollars and 44 cents; an English guinea is 4 dollars and 66 cents. In New England, a shilling is $16\frac{2}{3}$ cents; and a pound is 3 dollars and $33\frac{1}{3}$ cents. In New York, a shilling is $12\frac{1}{2}$ cents; and a pound is 2 dollars and 50 cents.

Pence Table.

	<i>s.</i>	<i>d.</i>
20 pence are one and eight pence	1	8
30 pence are two and six pence	2	6
40 pence are three and four pence	3	4
50 pence are four and two pence	4	2
60 pence are five shillings	5	0
70 pence are five and ten pence	5	10
80 pence are six and eight pence	6	8
90 pence are seven and sixpence	7	6
100 pence are eight and four pence	8	4
110 pence are nine and two pence	9	2
120 pence are ten shillings	10	0

Federal Money.

10 mills (<i>m.</i>)	make 1 cent	<i>ct.</i>
10 cents	1 dime	<i>d.</i>
10 dimes	1 dollar	<i>\$</i>
10 dollars	1 eagle	<i>E.</i>

This is the money of the United States. Cents are made of copper, dimes and dollars of silver, eagles and half eagles of gold. The usual method of reckoning is in dollars and cents ; 100 cents make a dollar. In New England a dollar is equal to 6 shillings ; in New York to 8 shillings ; in England to 4 shillings and 6 pence.

Avoirdupois Weight.

16 drams (<i>dr.</i>)	make 1 ounce	<i>oz.</i>
16 ounces	1 pound	<i>lb.</i>
28 pounds	1 quarter	<i>qr.</i>
4 quarters	1 hund. weight	<i>cwt.</i>
20 hundred weight	1 ton	<i>T.</i>

This is the common weight of steelyards and scales for meat, flour, sugar, tea, hay, &c.

Apothecaries' Weight.

20 grains (<i>gr.</i>)	make one scruple	<i>℞</i>
3 scruples	one dram	<i>ʒ</i>
8 drams	one ounce	<i>℥</i>
12 ounces	one pound	<i>℔</i>

This weight is for medicines.

Troy Weight.

24 grains (*gr.*) make 1 pennyweight *pwt.*

20 pennyweights 1 ounce *oz.*

12 ounces 1 pound *lb.*

This is used by goldsmiths to weigh gold, silver, jewels, &c.

Cloth Measure.

4 nails (*na.*) make 1 quarter of a yard *qr.*

4 quarters 1 yard *yd.*

3 quarters 1 Ell Flemish *E. Fl.*

5 quarters 1 Ell English *E. E.*

6 quarters 1 Ell French *E. Fr.*

This measure is used for all kinds of cloth, tape, &c.

Long Measure.

3 barley corns (*b. c.*) make 1 inch *in.*

12 inches 1 foot *ft.*

3 feet 1 yard *yd.*

5½ yards 1 rod, pole or perch *rd.*

40 rods 1 furlong *fur.*

8 furlongs 1 mile *m.*

3 miles 1 league *lea.*

69½ miles 1 degree *deg.*

360 degrees the circumference of the earth.

This is used to measure roads, rivers, timber, stone, &c. A hand is 4 inches; a cubit is a foot and a half; a fathom is 6 feet; a surveyor's chain is 4 rods or 66 feet.

Wine Measure.

4 gills (<i>gi.</i>)	make 1 pint	<i>pt.</i>
2 pints	1 quart	<i>qt.</i>
4 quarts	1 gallon	<i>gal.</i>
63 gallons	1 hogshead	<i>hhd.</i>
2 hogsheads	1 pipe	<i>p.</i>
2 pipes	1 tun	<i>T.</i>

This measure is used for wine, spirits, oil, &c. A barrel contains $31\frac{1}{2}$ gallons, and a tierce 42 gallons.

Dry Measure.

2 pints (<i>pt.</i>)	make 1 quart	<i>qt.</i>
8 quarts	1 peck	<i>pk.</i>
4 pecks	1 bushel	<i>bu.</i>
36 bushels	1 chaldron	<i>ch.</i>

This measure is used for grain, coal, salt, oysters, &c.

Land or Square Measure.

144 square inches (<i>sq. in.</i>)	are 1 square foot	<i>sq. ft.</i>
9 square feet	1 square yard	<i>sq. yd.</i>
$30\frac{1}{4}$ square yards	1 square rod	<i>sq. rd.</i>
40 square rods	1 square rood	<i>sq. rood.</i>
4 square roods	1 square acre	<i>sq. ac.</i>
640 square acres	1 square mile	<i>sq. m.</i>

This is used to measure land, sea, boards, and surfaces generally. An acre contains 160 square rods.

Solid Measure.

1728 solid inches make	1 solid foot <i>sol. ft.</i>
40 feet of round timber	} 1 ton or load <i>ld.</i>
50 feet of hewn timber	
128 solid feet	1 cord <i>cd.</i>

This is used to measure timber, wood, stone, and things that have length, breadth and thickness. A pile of wood 8 feet long, 4 feet wide, and 4 feet high, contains a cord.

Time.

60 seconds (<i>sec.</i>) make	1 minute <i>m.</i>
60 minutes	1 hour <i>h.</i>
24 hours	1 day <i>d.</i>
7 days	1 week <i>wk.</i>
4 weeks	1 month <i>m.</i>
365 days	1 year <i>yr.</i>
100 years	1 century <i>cen.</i>

A year contains 12 calender months, viz.

January	31 days	July	31 days
February	28 "	August	31 "
March	31 "	September	30 "
April	30 "	October	31 "
May	31 "	November	30 "
June	30 "	December	31 "

Every fourth year is called *leap year*, in which February has 29 days, and the year 366 days.

There are seven days in a week, viz.

Sunday,
Monday,
Tuesday,
Wednesday,
Thursday,
Friday,
Saturday,

The year is divided into four *seasons*, viz.
spring, summer, autumn, winter.

March,	} spring.	June,	} Summer.
April,		July,	
May,		August,	

September,	} autumn.	December,	} winter.
October,		January,	
November,		February,	

Circular Motion.

60 seconds (") make	1 minute '.
60 minutes	1 degree °.
30 degrees	1 sign S.

12 signs, or 360 degrees, the circle of the Zodiac.

This is used to measure circles, latitude, longitude, &c.

12 single things make	1 dozen
12 dozen	1 gross

This is used in counting eggs, screws, &c.

20 single things make 1 score

5 score 1 hundred

This is used in weighing pork, &c.

24 sheets make 1 quire

20 quires 1 ream

This is used in counting and selling paper.

NOTE.—On pages 14 and 15, the words “left hand” occur two or three times, for which read *right hand*.





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